CHAPTER 3 TRANSPORTATION ANALYSIS

This chapter describes the current transportation system in the Anaheim Rapid Connection (ARC) Study Area that would both benefit from and be affected by the proposed project alternatives under consideration. The Study Area's transportation system includes a freeway and arterial highway system, rail and bus transit, and bicycle and pedestrian facilities. This chapter provides an overview of the future transportation conditions both prior to and with implementation of the proposed transit system projects.

3.1 Overview of Existing Transportation System

3.1.1 Freeway Network

As shown in Figure 3.1, there are two freeways serving the Study Area:

Santa Ana Freeway (I-5) — This freeway roughly parallels the coast and runs in a northwest/southeast direction. Within the Study Area, the Interstate 5 freeway passes through the City of Anaheim and borders the southwest portion of Orange County. It is a ten-lane freeway including two high-occupancy vehicle (HOV) lanes. The interchanges that service the Study Area include Harbor Boulevard, Disney Way and Katella Avenue/Orangewood Avenue.

Orange Freeway (SR-57) — This freeway operates in a north-south direction with its southern terminus at the I-5 and Garden Grove (SR-22) freeways just south of the Anaheim city limit. SR-57 provides a link between the San Gabriel Valley and Central Orange County, as a primary north-south artery in North and Central Orange County. SR-57 is a ten-lane freeway, including two HOV lanes, and services the Study Area via the Katella Avenue and Orangewood Avenue interchanges.

It should be noted that the two freeways were not evaluated as part of this transportation analysis. The freeways serving the Study Area are not anticipated to experience any increases to freeway volumes as most origin-destination pairs would occur within the localized street system. For example, most trips occur between the Convention Center and GardenWalk, or from the Angel Stadium of Anaheim (hereinafter referred as Angel Stadium) to The Anaheim Resort and so forth. All other regional trips would likely utilize the proposed California High-Speed Rail (CHSR), resulting in potential minor decreases to freeway volumes.

3.1.2 Arterial Network

The City of Anaheim has developed a detailed street classification network that includes scenic expressways, smartstreets, major arterials, primary arterials, secondary arterials, and collector streets. These classifications are consistent with those of the Orange County Transportation Authority (OCTA) Master Plan of Arterial Highways (MPAH). A brief description of each of the roadway classifications is provided below and illustrated in Figure 3.1. It is important to note that there are some exceptions to each classification and that individual streets may have modified standards. Study Area arterials fall into the following 10 roadway classifications:

- **Scenic Expressway –** Divided roadways that have restricted access, serve intercity traffic, and provide scenic vistas. Weir Canyon Road and portions of the Santa Ana Canyon Road are both scenic expressways. These four to six lane divided facilities have a right-of-way that varies from a width of 106 to 148 feet.
- **Resort Smartstreet –** Divided roadways that are six or eight lanes with a typical right-of-way width of 120 to 166 feet. Smartstreets improve roadway traffic capacity through a variety of measures such as traffic signal synchronization, bus turnouts, intersection improvements, removed on-street parking, consolidated driveways, and landscaped median island construction with limited left turn openings.
- **Stadium Smartstreet** – Divided roadways that are six or eight lanes with a typical right of way width of 130 to 144 feet. These facilities utilize capacity improvements similar to the Resort Smartstreet.
- **Major Arterial –** Roadways that connect to freeways and typically have six lanes, a landscaped median, left turn pockets, parking lanes adjacent to each curb and a right-of-way width of 120 3
- **Primary Arterial –** Roadways that provide for circulation within the City and to its adjacent communities. Primary arterials are typically six lane divided facilities with no parking or four lane divided with left turn pockets and two parking lanes. The typical right-of-way width of a primary arterial is 106 feet.
- **Hillside Primary Arterial** – Roadways that provide for circulation within the City and to its adjacent communities through areas that are constrained by terrain. Primary arterials are typically six lane divided facilities with no parking or four lane divided with left turn pockets and two parking lanes. The typical right-of-way width of a hillside primary arterial is 106 feet in areas without driveway access and 118 feet in areas in areas with driveway access.
- **Secondary Arterial** – Roadways that provide for circulation within the City. Secondary arterial facilities are four-lane roadways, with two parking lanes, that are undivided. These facilities have a typical right-of-way width of 90 feet.
- **Hillside Secondary Arterial –** Roadways that provide for circulation within the City through areas that are constrained by terrain. Hillside secondary arterial facilities are four-lane roadways, with two parking lanes, that are undivided. These facilities have a typical right-of-way width of 66 feet without driveway access and 78 feet with driveway access.
- **Collector Street –** Roadways that distribute residential traffic from its point of origin to higher capacity facilities. They are typically two-lane undivided roadways with a 64-foot right of way width.
- **Hillside Collector Street** – Roadways that distribute residential traffic from its point of origin to higher capacity facilities through areas that are constrained by terrain. They are typically two-lane undivided roadways with a 42-foot right-of-way width without driveway access and 54 feet with driveway access.

Figure 3.1 – Existing Highway System in the Study Area

Table 3.1 below lists the major, primary, and secondary arterial roads in an east-west and north-south direction in the Study Area based on information from the City of Anaheim and OCTA.

Table 3.1 – Arterial Roads in Study Area

Street	Classification	No. of Lanes	Divided Roadway?	Curb-to-Curb Width
Disney Way				
- Between Harbor Blvd and Anaheim Way	Major	6	Y	90’
Katella Avenue				
- Between Ninth St and Walnut St	Major	6	Y	80'
- Between Walnut St and Manchester Ave	Smart Street Resort	6	N	90’ – 120’
- Between Manchester Ave and Santa Ana River	Smart Street Stadium	6	Y	90’ – 100’
Gene Autry Way				
- Between Anaheim Way and State College Blvd	Primary	4	Y	60’
Harbor Boulevard				
- Between Orangewood Ave and Katella Ave	Major	6	Y	90’
- Between Katella Ave and Manchester Ave	Major	5	Y	80’ – 90’’
- Between Manchester Ave and I-5	Major	6	Y	100’
Clementine Street				
- Between Harbor Blvd and Orangewood Ave	Secondary	4	N	60’
Anaheim Boulevard				
- Between Katella Ave and I-5	Primary	6	Y	110’
Haster Street				
- Between Orangewood Ave and Katella Ave	Primary	4	N	60’
Anaheim Way				
- Between Orangewood Ave and Katella Ave	Secondary	3	N	40’ – 60’
Lewis Street				
Between Katella Ave and Cerritos Ave	Primary	4	Y	60’ – 70’
Between Cerritos Ave and Ball Rd	Primary	4	Y	60’ – 65’
State College Boulevard				
- Between Ball Rd and Cerritos Ave	Primary	6	N	80’
- Between Cerritos Ave and Orangewood Ave	Major	6	Y	90’

3.2 Existing Transportation Conditions

This section presents the existing traffic operating conditions at key intersections and roadway segments within the Study Area. The locations of the intersections and corresponding roadway segments being studied were determined based on the alternative alignments and the potential effects that each may have on the adjacent transportation network.

3.2.1 Intersections

A total of 25 intersections were selected for evaluation in consultation with City staff, as listed in Table 3.2 below. In general, these locations are the key intersections along each of the three alternative alignments as identified below. Future intersections, based on City plans, are included in the list and are analyzed as part of the Future 2035 analysis.

Table 3.2 – Intersection Analysis Locations

ID	Study Area Intersection	Enhanced Bus	Streetcar	Elevated Fixed-Guideway
1	Harbor Boulevard/Shuttle Entrance		X	X
2	Harbor Boulevard/Disney Way	X	X	X
3	Harbor Boulevard/Katella Ave	X	X	X
4	Harbor Boulevard/Convention Way	X	X	X
5	Clementine Street/Disney Way	X	X	
6	Clementine Street Katella Avenue		X	
7	I-5 (SB) Off Ramp/Disney Way	X		
8	Anaheim Boulevard Disney Way	X		X
9	Anaheim Boulevard/Haster Street/Katella Avenue	X	X	X
10	Haster Street / Gene Autry Way (future)	X		X
11	Manchester Avenue (I-5 SB Ramps)/Katella Avenue		X	
12	Anaheim Way (I-5 NB Ramps)/Katella Avenue		X	
13	Lewis Street/Katella Avenue		X	
14	Lewis Street/Gene Autry Way (future)	X		X
15	I-5 High-Occupancy Vehicle (HOV) Ramps/Gene Autry Way	X		X
16	Market Street/Katella Avenue (future)		X	
17	Market Street/Gene Autry Way (future)	X		X
18	State College Boulevard/Katella Avenue	X	X	
19	State College Boulevard/Gateway Center Drive	X		
20	State College Boulevard/Gene Autry Way	X		X
21	Howell Avenue/Katella Avenue	X		
22	Sportstown/Katella Avenue	X	X	
23	SR-57 NB Ramps/Katella Avenue	X		
24	SR-57 SB Ramps/Katella Avenue	X		
25	Douglass Road/Katella Avenue	X		

Notes: NB – Northbound; and SB – Southbound

3.2.1.1 Data Collection

Existing weekday a.m. and p.m. peak hour counts were obtained from the *Platinum Triangle Master Land Use Plan (PTMLUP) Traffic Study*. However, since the data collected for that study was originally obtained in 2008, spot counts at a limited number of locations were collected on August 2, 2012 to identify any substantial changes to the traffic volumes or traffic patterns over the last four years.

The results of the count comparison, as summarized in an August 9, 2012 memorandum to the City of Anaheim (included in *Appendix B: Traffic Analysis*), revealed that changes in traffic volumes and traffic patterns were evident specifically at movements/intersections that provide or previously provided access to Disneyland parking facilities. For example, after 2008, the Timon lot (accessed at the intersection of Harbor Boulevard and Disney Way) was closed and the Toy Story lot (accessed at the intersection of Harbor Boulevard and Convention Way) was opened, resulting in a change in traffic volume and traffic patterns at certain Study Area intersections. The count comparison also revealed additional volumes near the intersection of State College Boulevard and Katella Avenue, due primarily to growth in and around the Platinum Triangle area. Counts at intersections adjacent to this location were adjusted accordingly. The existing count data reflects the appropriate adjustments, where necessary. All other locations remained similar to the 2008 data and therefore adjustments were not needed. The following summarizes the adjustments made:

- Reduction in volume of northbound left and southbound right movements at the intersection of Harbor Boulevard and Disney Way, volume added to corresponding northbound through and southbound through movements.
- Volumes added to southbound through at the intersection of Harbor Boulevard and Katella Avenue.
- Volumes added to southbound left turn movement at intersection of Harbor Boulevard and Convention Way.
- Eastbound and westbound through volumes increased along Katella Avenue at the intersection with Market Street, State College Boulevard, and Sportstown.

3.2.1.2 Existing Intersection Analysis

A peak hour level of service (LOS) analysis to determine existing conditions was conducted for all intersections potentially affected by the alternatives to determine existing conditions. The LOS analysis was used to evaluate congestion and intersection capacity utilization (ICU or volume-to-capacity ratio) for the Study Area intersections. The relative level of congestion is evaluated on a scale from A through F. LOS A indicates free-flow conditions with no delay whereas LOS F indicates breakdown of the system with very long delays.

The City of Anaheim Criteria for Preparation of Traffic Impact Studies requires an ICU of no more than of 0.90, or LOS D, as the lowest acceptable service at intersections. Intersections that operate at a level of service below LOS D (i.e., LOS E or F) are deemed to be congested. The City requires Study Area intersections to be evaluated through the aforementioned ICU analysis which compares peak hour traffic volumes to intersection capacity. A minimum clearance interval of 0.05, in association with lane capacities of 1,700 vehicles per hour of green time for through and turn lanes, was assumed for the ICU calculations. Table 3.3 below presents the ICU level of service thresholds and corresponding traffic flow description used.

Table 3.3 – Level of Service Definition

Level of Service (LOS)	Volume/Capacity	Description of Traffic Flow
A	0.000 – 0.600	Free flow
B	0.601 – 0.700	Free flow with periodic slowing
C	0.701 – 0.800	Start of congestion
D	0.801 – 0.900	Traffic volumes approaching capacity
E	0.901 – 1.000	System near or at capacity resulting in unstable flow
F	> 1.000	System beyond capacity with stop and go traffic

Source: City of Anaheim Criteria for Preparation of Traffic Impact Studies

Table 3.4 presents the ICU and LOS results for the Study Area intersections under existing conditions during the a.m. and p.m. peak hours. Existing lane geometrics were assumed in the ICU and LOS analyses. The detailed existing ICU worksheets are presented in *Appendix B*.

Table 3.4 – Existing Intersection Level of Service (2012)

ID	Intersection	Existing Conditions			
		A.M. Peak Hour		P.M. Peak Hour	
		ICU	LOS	ICU	LOS
1	Harbor Boulevard/Shuttle Entrance	0.30	A	0.34	A
2	Harbor Boulevard/Disney Way*	0.32	A	0.42	A
3	Harbor Boulevard/Katella Avenue*	0.57	A	0.63	B
4	Harbor Boulevard/Convention Way*	0.30	A	0.35	A
5	Clementine Street/Disney Way	0.19	A	0.23	A
6	Clementine Street/Katella Avenue	0.53	A	0.60	A
7	I-5 SB Off Ramp/Disney Way	0.20	A	0.24	A
8	Anaheim Boulevard/Disney Way	0.43	A	0.49	A
9	Anaheim Boulevard/Haster Street Katella Avenue	0.47	A	0.58	A
10	Haster Street/ Gene Autry Way	Not Applicable (Future Intersection)			
11	Manchester Avenue (I-5 SB Ramps)/Katella Avenue	0.55	A	0.52	A
12	Anaheim Way (I-5 NB Ramps)/Katella Avenue	0.49	A	0.50	A
13	Lewis Street/Katella Avenue	0.48	A	0.62	B
14	Lewis Street /Gene Autry Way (future)	Not Applicable (Future Intersection)			
15	I-5 HOV Ramps/Gene Autry Way	0.07	A	0.07	A
16	Market Street/Katella Avenue (future)	Not Applicable (Future Intersection)			
17	Market Street/Gene Autry Way (future)	Not Applicable (Future Intersection)			
18	State College Boulevard/Katella Avenue*	0.45	A	0.59	A
19	State College Boulevard/ Gateway Center Drive	0.26	A	0.33	A
20	State College Boulevard/ Gene Autry Way	0.30	A	0.28	A
21	Howell Avenue/Katella Avenue	0.38	A	0.55	A
22	Sportstown/Katella Avenue*	0.33	A	0.47	A

Table 3.4 – Existing Intersection Level of Service (2012)

ID	Intersection	Existing Conditions			
		A.M. Peak Hour		P.M. Peak Hour	
		ICU	LOS	ICU	LOS
23	SR-57 NB Ramps/Katella Avenue	0.36	A	0.40	A
24	SR-57 SB Ramps/Katella Avenue	0.40	A	0.40	A
25	Douglass Road/Katella Avenue	0.41	A	0.49	A

Source: AECOM

Notes: ICU – Intersection Capacity Utilization; AM – morning; PM – evening; NB – Northbound; and SB – Southbound

* Intersection reflects adjustments made based on the count comparison.

As shown in Table 3.4, all Study Area intersections operate at acceptable LOS B or better during both the morning (a.m.) and evening (p.m.) peak hours under existing conditions, which indicates that the intersections currently operate with minimal congestion and are under capacity.

3.2.2 Roadway Segments

Key roadway segments between intersections along each of the alternative alignments, generally located between the Study Area intersections, were selected for analysis. Table 3.5 presents the 21 roadway segments agreed upon with City staff for analysis.

Table 3.5 – Roadway Segment Analysis Locations

Identification	Arterial	From	To
A	Anaheim Boulevard	Katella Avenue	Disney Way
B	Clementine Street	Katella Avenue	Manchester Avenue
C	Disney Way	Harbor Boulevard	Clementine Street
D	Disney Way	Clementine Street	Anaheim Boulevard
E	Gene Autry Way	Haster Street	I-5 Freeway
F	Gene Autry Way	I-5 Freeway	State College Boulevard
G	Harbor Boulevard	Convention Way	Katella Avenue
H	Harbor Boulevard	Katella Avenue	Disney Way
I	Harbor Boulevard	Disney Way	Shuttle Entrance
J	Haster Street	Katella Avenue	Gene Autry Way
K	Katella Avenue	Harbor Boulevard	Clementine Street
L	Katella Avenue	Clementine Street	Anaheim Boulevard
M	Katella Avenue	Anaheim Boulevard	Manchester Avenue
N	Katella Avenue	Manchester Avenue	Anaheim Way
O	Katella Avenue	Anaheim Way	Lewis Street
P	Katella Avenue	Lewis Street	State College Boulevard
Q	Katella Avenue	State College Boulevard	Sportstown
R	Katella Avenue	Sportstown	Howell Avenue
S	Katella Avenue	Howell Avenue	SR-57 Freeway
T	Katella Avenue	SR-57 Freeway	Douglass Road
U	State College Boulevard	Katella Avenue	Gene Autry Way

Source: AECOM

3.2.2.1 Data Collection

The source of existing average daily traffic (ADT) counts was the 2009 ADT counts obtained from the PTMLUP Traffic Study and then "grown" to calculate current (2012) ADT. The growth rate applied to the 2009 counts to arrive at the 2012 counts was based on an approved growth rate per City direction.

3.2.2.2 Existing Roadway Segment Analysis

The arterial roadway criteria for the City of Anaheim involve the use of ICU. LOS C (not to exceed 0.80) is the performance standard that the City has adopted for the entire Study Area. It should be noted that no Study Area intersections or roadway segments lie within the City of Orange's jurisdiction. Table 3.6 presents the ADT, capacity, and LOS results for the Study Area roadway segments under existing daily conditions. As shown in Table 3.6 and illustrated in Figure 3.2, roadway segment "J" (Haster Street from Katella Avenue to Gene Autry Way) is the only segment that currently operates at an unacceptable LOS (LOS D) under existing conditions. Within the existing (2012) conditions, all other Study Area segments operate at LOS C or better, which indicates that they are operating with minimal congestion and sufficient capacity.

3.3 Future 2035 Transportation Conditions

This section presents projected future traffic operating conditions at key intersections and on roadway segments within the ARC Study Area under each of the following four project alternatives:

- **No Build Alternative –** All of the planned and programmed Study Area improvements that are included in the financially constrained project list of the Orange County Transportation Authority (OCTA) 2010 Long Range Transportation Plan (LRTP) and the Southern California Association of Governments (SCAG) 2012 Regional Transportation Plan (RTP), excluding the ARC project.

- **Enhanced Bus Alternative –** Low capital cost improvements to the Study Area's transit and roadway systems that meet the identified purpose and need; and provision of enhanced bus service that has a similar level of service as that provided by a rail system. This alternative includes branded bus service, some dedicated bus lane operations, and limited signal preemption or signal priority.

- **Streetcar Alternative –** A street-running rail system operating in a mixed-flow configuration primarily in the existing street right-of-way. Alternative includes some signal preemption or signal priority.

- **Elevated Fixed-Guideway Alternative –** An automated transit system that operates on an elevated fixed-guideway structure on columns located primarily within the existing street right-of-way.

Figure 3.2 – Existing Roadway and Intersection Deficiencies in the Study Area

Table 3.6 – Existing Average Daily Traffic (ADT) Analysis for Roadway Segments (2012)

ID	Arterial	From	To	Number of Lanes	Existing Conditions			
					ADT[1]	Capacity	ICU[2]	LOS
A	Anaheim Boulevard	Katella Avenue	Disney Way	6D	20,543	56,300	0.36	A
B	Clementine Street	Katella Avenue	Manchester Avenue	4U	7,961	25,000	0.32	A
C	Disney Way	Harbor Boulevard	Clementine Street	6D	8,236	56,300	0.15	A
D	Disney Way	Clementine Street	Anaheim Boulevard	6D	14,713	56,300	0.26	A
E	Gene Autry Way	Haster Street	I-5 Freeway	Not Applicable (Future Arterial)				
F	Gene Autry Way	I-5 Freeway	State College Boulevard	4U	2,353	25,000	0.09	A
G	Harbor Boulevard	Convention Way	Katella Avenue	6D	42,856	56,300	0.76	C
H	Harbor Boulevard	Katella Avenue	Disney Way	6D	40,715	56,300	0.72	C
I	Harbor Boulevard	Disney Way	Shuttle Entrance	6D	43,820	56,300	0.73	C
J	Haster Street	Katella Avenue	Gene Autry Way	4U	20,946	25,000	**0.84**	**D**
K	Katella Avenue	Harbor Boulevard	Clementine Street	6D	41,446	56,300	0.74	C
L	Katella Avenue	Clementine Street	Anaheim Boulevard	6D	40,831	56,300	0.73	C
M	Katella Avenue	Anaheim Boulevard	Manchester Avenue	6D	40,100	56,300	0.71	C
N	Katella Avenue	Manchester Avenue	Anaheim Way	6D	40,100	56,300	0.71	C
O	Katella Avenue	Anaheim Way	Lewis Street	6D	37,142	56,300	0.66	B
P	Katella Avenue	Lewis Street	State College Boulevard	6D	32,076	56,300	0.57	A
Q	Katella Avenue	State College Boulevard	Sportstown	6D	34,768	56,300	0.62	B
R	Katella Avenue	Sportstown	Howell Avenue	6D	36,294	56,300	0.64	B
S	Katella Avenue	Howell Avenue	SR-57 Freeway	6D	40,269	56,300	0.72	C
T	Katella Avenue	SR-57 Freeway	Douglass Road	6D	31,387	56,300	0.56	A
U	State College Boulevard	Katella Avenue	Gene Autry Way	6D	21,327	56,300	0.38	A

Sources: AECOM

Notes: ICU –Intersection Capacity Utilization; D – Divided Roadway; U – Undivided Roadway

[1] Existing arterial average daily traffic (ADT) calculated by applying a two percent per year growth rate to the 2009 Platinum Triangle Master Land Use Plan Traffic Study existing volumes (PB, 2009)

[2] Volume-to-capacity ratio

Future year No Build volumes were provided by the City of Anaheim, based on the *Revised Platinum Triangle Expansion EIR* adopted in 2010. The Platinum Triangle study used forecasted traffic volumes to 2030, but was based from a 2025 horizon year traffic model. City staff worked with OCTA to determine the factors used to adjust the 2025 model to future 2030 and 2035 years. These factors looked at base year and horizon year socio-economic data to determine the increase in traffic that could be expected between 2025, 2030, and 2035. For the AA study, the 2030 volumes from the Platinum Triangle were reduced back to the original 2025 levels by applying a factor of 1.8 percent which was used in the Platinum Triangle analysis. Then, the 2025 volumes were factored up to 2035 volumes by applying a 4.35 percent increase, which is consistent with other projects in the vicinity that have used a 2035 horizon year.

According to the data developed through the *Travel Demand Forecasting Results Report (Appendix C)*, each of the build alternatives is projected reduce automobile trips in the Study Area. However, these trips would be removed from throughout the Study Area, based on the origin/destination pairs of each trip, and no one intersection or roadway segment would be reduced by this amount. Therefore, the potential decrease in automobile trips due to the build alternatives would be minimal on an intersection by intersection or street by street basis. As a result, based on discussions with City staff, the City gave concurrence on the conservative approach to assume no decreases in intersection or roadway segment volumes due to any of the build alternatives.

3.3.1 Intersections

3.3.1.1 No Build Alternative

The intersection analysis considers the effect that growth within the Study Area will have on the future circulation system. Future City of Anaheim General Plan Circulation Element lane geometrics were assumed in the No Build Alternative intersection analysis.

Table 3.7 and Figure 3.3 present the future No Build Alternative morning and evening peak hour intersection analysis for all 25 key Study Area intersections. As shown, 7 out of 25 Study Area intersections are forecast to operate at an unacceptable LOS of E or F. The detailed ICU worksheets are presented in *Appendix B*.

Table 3.7 – Future No Build Alternative Intersection Level of Service (2035)

ID	Intersection	Future 2035 No Build Alternative			
		A.M. Peak Hour		P.M. Peak Hour	
		ICU	LOS	ICU	LOS
1	Harbor Boulevard/Transit Center	0.30	A	0.36	A
2	Harbor Boulevard/Disney Way	0.73	C	0.89	D
3	Harbor Boulevard/Katella Avenue	0.83	D	**0.97**	**E**
4	Harbor Boulevard/Convention Way	0.60	B	0.79	C
5	Clementine Street Disney Way	0.58	A	0.58	A
6	Clementine Street/Katella Avenue	0.77	C	**0.92**	**E**

Table 3.7 – Future No Build Alternative Intersection Level of Service (2035)

ID	Intersection	Future 2035 No Build Alternative			
		A.M. Peak Hour		P.M. Peak Hour	
		ICU	LOS	ICU	LOS
7	I-5 SB Off Ramp/Disney Way	0.51	A	0.46	A
8	Anaheim Boulevard/Disney Way	0.72	C	0.87	D
9	Anaheim Boulevard/Haster Street/Katella Avenue	**0.92**	**E**	**0.94**	**E**
10	Haster Street/Gene Autry Way	0.80	C	0.89	D
11	Manchester Avenue (I-5 SB Ramps)/Katella Avenue	0.75	C	0.73	C
12	Anaheim Way (I-5 NB Ramps)/Katella Avenue	0.83	D	0.79	C
13	Lewis Street/Katella Avenue	0.71	C	0.84	D
14	Lewis Street/Gene Autry Way	0.66	B	0.86	D
15	I-5 HOV Ramps/ Gene Autry Way	0.54	A	0.77	C
16	Market Street/Katella Avenue	0.76	C	0.89	D
17	Market Street/Gene Autry Way	0.43	A	0.71	C
18	State College Boulevard/Katella Avenue	0.86	D	**0.91**	**E**
19	State College Boulevard/Gateway Center Drive	**0.92**	**E**	0.79	C
20	State College Boulevard/Gene Autry Way	**0.92**	**E**	0.74	C
21	Howell Avenue/Katella Avenue	0.64	B	0.87	D
22	Sportstown/Katella Avenue	0.75	C	0.88	D
23	SR-57 NB Ramps/Katella Avenue	0.70	B	0.74	C
24	SR-57 SB Ramps/Katella Avenue	0.73	C	0.71	C
25	Douglass Road/Katella Avenue	**0.96**	**E**	**0.98**	**E**

Source: AECOM

Notes: ICU – Intersection Capacity Utilization; AM – morning; PM – evening; NB – Northbound; SB – Southbound; and HOV – High Occupancy Vehicle

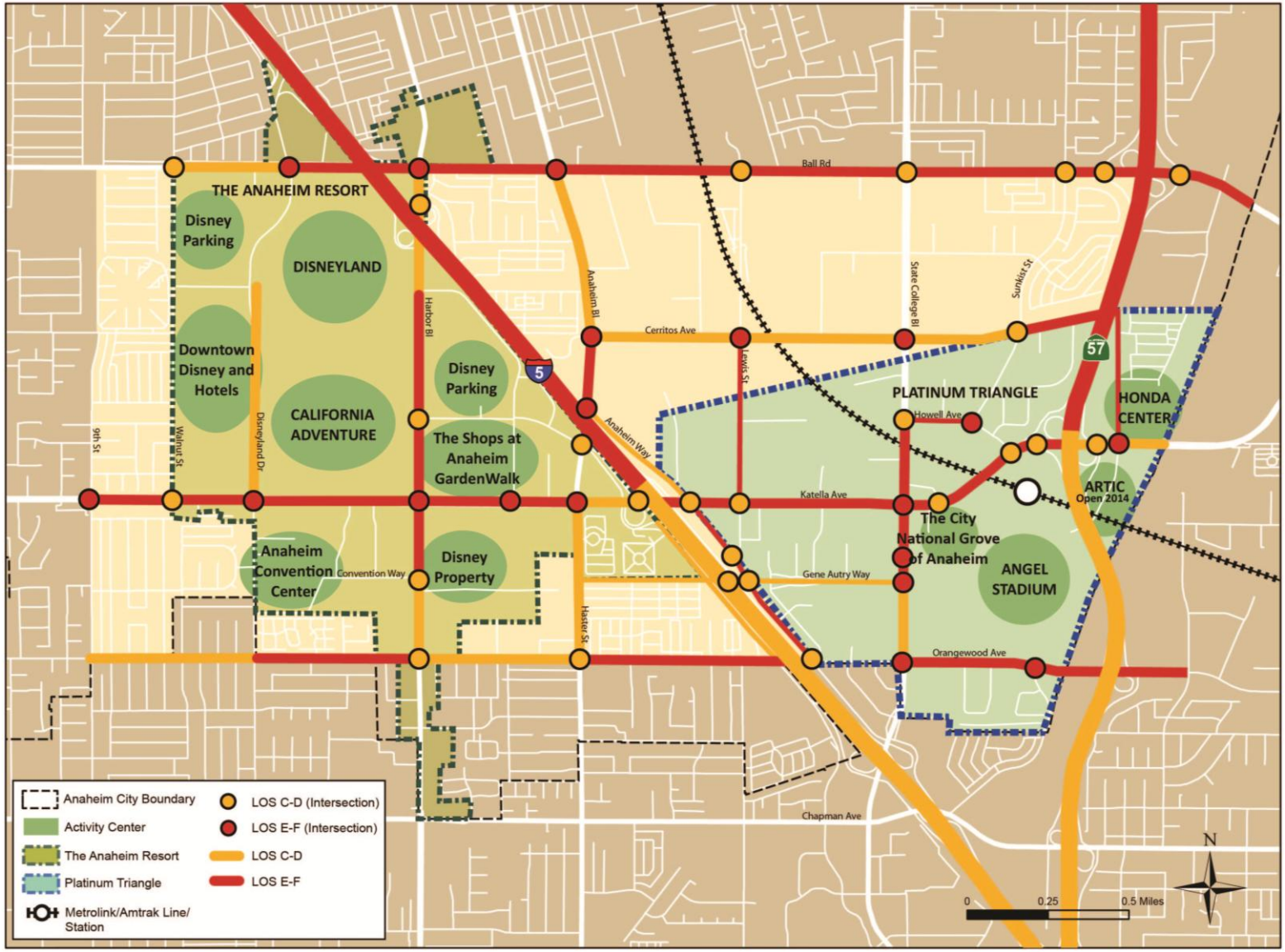
Bolded and Shaded – Intersection operates at an unacceptable LOS E or worse, per City guidelines

3.3.1.2 Enhanced Bus Alternative

The Enhanced Bus Alternative provides low capital cost improvements to the Study Area's transit and roadway systems that meet the identified purpose and need, and would have a similar level of service as that provided by a rail system. This alternative includes branded bus service, some dedicated bus lane operations, and limited signal preemption or signal priority. The benefits associated with this alternative, referenced from the Draft Forecasting Results Report, include:

- Ridership of approximately 6,321 passengers per day;
- Reduction of approximately 630 daily automobile trips within the corridor and 319 trips regionally; and

Figure 3.3 – Future Roadway and Intersection Deficiencies in the Study Area



- Reduction in automobile vehicle miles traveled (VMT) of 1,269 miles within the corridor and 9,802 miles regionally.

As discussed previously, although this alternative has the potential to reduce automobile trips by 630 daily trips, this is a corridor total and no one intersection or roadway segment would be reduced by this amount. The reduction in trips would occur throughout the Study Area based on several origin/destination pairs. Therefore, the potential decrease in automobile trips due to the Enhanced Bus Alternative would be minimal on an intersection by intersection or street by street basis, and the conservative assumption of no reduction in volumes at the analysis locations would be appropriate.

3.3.1.2.1 Enhanced Bus Alternative Analysis

Analysis of the Enhanced Bus Alternative started with the No Build Alternative as the basis for intersection traffic volumes. The intersection analysis for the Enhanced Bus Alternative also included: a) the addition of Enhanced Bus service with a peak period headway of ten minutes; and b) capacity adjustments due to the physical and operational characteristics of buses (which reduce the vehicle carrying capacity of the roadway even as they may increase its person carrying capacity); and c) limited transit signal priority treatments along the alignment. Due to these factors, intersections would operate slightly worse with implementation of the Enhanced Bus Alternative when compared to the No Build Alternative conditions. These considerations are explained in more detail below.

Enhanced Bus Alternative Volumes

Additional traffic associated with operation of the bus was added to the 2035 No Build Alternative traffic volumes to reflect study year of 2035. Calculation of the number of trips the bus would make during the a.m. and p.m. peak hours used the following assumptions:

- Frequency – Ten minute headways during peak and off-peak, both directions, 18 hours a day; and
- Passenger Car Equivalent (PCE) – Bus assumed to be operationally equivalent to 2.0 passenger cars, consistent with the Highway Capacity Manual.

Operation of the Enhanced Bus Alternative would add approximately 24 vehicles on an hourly basis to each of the intersections along the alignment, which would cause slight increases to the ICU values and corresponding LOS.

Capacity Adjustments

Table 3.8 summarizes the capacity adjustments made ICU worksheets to account for the effects of the Enhanced Bus Alternative on intersection analysis. These capacity adjustments also apply to the Streetcar Alternative. Since both the Enhanced Bus and Streetcar Alternatives would operate primarily in shared traffic lanes, both alternatives could potentially affect traffic flows and capacity. It should be noted that the limited Transit Signal Priority treatments were applied to all Study Area intersections. However, implementations of specific treatments are subject to final design and review. Detailed calculations for each of the capacity adjustments are included in Appendix B.

Table 3.8 – Enhanced Bus Alternative Capacity Adjustments

Type of Adjustment	Description	Implementation
Heavy Vehicle[1]	Accounts for the additional spaces occupied by these vehicles and for the difference in operating capabilities of heavy vehicles compared to passenger cars (e.g., slower acceleration and deceleration).	Applied to all lanes where the Enhanced Bus Alternative operates. Results in a slight decrease in vehicular lane capacity.
Bus Blockage[1]	Accounts for the effects of transit buses that stop to discharge or pick up passengers at a near-side or far-side bus stop within 250 feet of the stop line (upstream or downstream).	Applied to all intersections within 250 feet of the proposed stations (ARTIC, Triangle, Haster, Resort, Convention), decreasing vehicular lane capacity.
Right Turns[1]	Intended to reflect the effect of geometry on buses, dependent upon whether the turn is made from and exclusive or shared lane, and whether right turn on red is permitted.	Applied to all bus right turn movements at intersections (e.g., westbound right turn from Gene Autry Way to Haster Street), resulting in lower vehicular lane capacity.
Left Turns[1]	Similar to the RT adjustment, LT accounts for geometry, phasing, proportion of left-turning vehicles using a shared lane group, and opposing flow rate.	Applied to all locations where the bus would make a left turn (e.g., eastbound left from Convention Way to Harbor Boulevard), resulting in lower vehicular lane capacity.
Transit Signal Priority[2]	Accounts for limited transit signal priority, preferential, or preemption for buses at all Study Area intersections.	Allows extension or early recall of green phase so bus can catch the green phase or clear intersection at the end of a cycle. Results in a capacity increase to lanes the bus operates in but reduces capacity of other lanes.

Sources: [1] *Highway Capacity Manual*, 2000; and [2] Transit Signal Priority calculated based on the average number of cycles per hour during peak hours

Table 3.9 presents the future Enhanced Bus Alternative morning and evening peak hour intersection analysis for the 19 Study Area intersections along the alignment, taking into account the additional bus vehicles and the capacity adjustments listed above. The detailed ICU worksheets are presented in Appendix B. As shown in this table, 8 out of 19 intersections are forecast to operate at an unacceptable LOS of E or F – two more than under the No Build Alternative. With the Enhanced Bus Alternative, the intersections of Harbor Boulevard/Disney Way and Haster Street/Gene Autry Way are projected to degrade from acceptable LOS D to unacceptable LOS E during the p.m. peak hour. Under the No Build Alternative, both intersections are projected to be at the upper limit of LOS D. As such, the minor capacity adjustments – specifically the left turn adjustments - due to the Enhanced Bus caused these intersections to w slightly to LOS E. Figure 3.4 illustrates the Enhanced Bus Alternative Alignment, with corresponding intersection LOS.

Table 3.9 – Future Enhanced Bus Alternative Intersection LOS (2035)

ID	Intersection	No Build Alternative				Enhanced Bus Alternative			
		A.M. Peak Hour		P.M. Peak Hour		A.M. Peak Hour		P.M. Peak Hour	
		ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS
2	Harbor Boulevard/Disney Way	0.73	C	0.89	D	0.76	C	**0.92**	**E**
3	Harbor Boulevard/Katella Avenue	0.83	D	**0.97**	**E**	0.84	D	**0.96**	**E**
4	Harbor Boulevard/Convention Way	0.60	B	0.79	C	0.62	B	0.80	C
5	Clementine Street/Disney Way	0.58	A	0.58	A	0.69	B	0.71	C
7	I-5 SB Off Ramp/Disney Way	0.51	A	0.46	A	0.61	B	0.60	A
8	Anaheim Boulevard/Disney Way	0.72	C	0.87	D	0.78	C	0.90	D
9	Anaheim Boulevard/Katella Avenue	**0.92**	**E**	**0.94**	**E**	**0.93**	**E**	**0.95**	**E**
10	Haster Street/Gene Autry Way	0.80	C	0.89	D	0.80	C	**0.91**	**E**
14	Lewis Street/Gene Autry Way	0.66	B	0.86	D	0.66	B	0.87	D
15	I-5 HOV Ramps/Gene Autry Way	0.54	A	0.77	C	0.55	A	0.76	C
17	Market Street/Gene Autry Way	0.43	A	0.71	C	0.44	A	0.72	C
18	State College Boulevard/Katella Avenue	0.86	D	**0.91**	**E**	0.88	D	**0.91**	**E**
19	State College Boulevard/Gateway Center Drive	**0.92**	**E**	0.79	C	**0.91**	**E**	**0.80**	**C**
20	State College Boulevard/Gene Autry Way	**0.92**	**E**	0.74	C	**0.93**	**E**	0.75	C
21	Howell Avenue/Katella Avenue	0.64	B	0.87	D	0.64	B	0.88	D
22	Sportstown/Katella Avenue	0.75	C	0.88	D	0.75	C	0.90	D
23	SR-57 NB Ramps/Katella Avenue	0.70	B	0.74	C	0.70	B	0.79	C
24	SR-57 SB Ramps/Katella Avenue	0.73	C	0.71	C	0.74	C	0.72	C
25	Douglass Road/Katella Avenue	**0.96**	**E**	**0.98**	**E**	**0.97**	**E**	**0.99**	**E**

Source: AECOM

Notes: ICU –Intersection Capacity Utilization; D – Divided Roadway; U – Undivided Roadway; NB – Northbound; SB – Southbound; and HOV – High Occupancy Vehicle

[1] Existing arterial average daily traffic (ADT) calculated by applying a two percent per year growth rate to the 2009 Platinum Triangle Master Land Use Plan Traffic Study existing volumes (PB, 2009)

[2] Volume-to-capacity ratio

Bolded and Shaded – Intersection operates at an unacceptable LOS E or worse, per City guidelines.

Overall, as shown in Table 3.9, the ICU and corresponding LOS at the Study Area intersections along the alignment generally get slightly worse (than under the No Build Alternative) with implementation of the Enhanced Bus Alternative. The most significant increase in ICU occurs at the intersections along Disney Way, primarily due to the exclusive operation of the bus along Disney Way (a reduction of one travel lane in each direction). Locations where the bus would operate with left or right turns also experience an increase in ICU due to additional capacity adjustments for turns. Locations along Gene Autry Way experience higher ICU values due to congestion at the cross streets. Due to the limited transit priority treatments along the bus route, these streets would be negatively affected by signals extending green times to accommodate the buses.

3.3.1.3 Streetcar Alternative

The Streetcar Alternative is a street-running rail system operating in a mixed-flow configuration primarily in the existing street right-of-way. The benefits associated with this alternative, referenced from the Draft Forecasting Results Report, include:

- Ridership of approximately 7,717 passengers per day;
- Reduction of approximately 732 daily automobile trips within the corridor and 496 trips regionally; and
- Reduction in automobile vehicle miles traveled (VMT) of 1,528 miles within the corridor and 15,279 miles regionally.

As discussed previously, although this alternative has the potential to reduce automobile trips by 732 daily trips, this would be a corridor total and no one intersection or roadway segment would be reduced by this amount. The reduction in trips would occur throughout the Study Area based on several origin/destination pairs. Therefore, the potential decrease in automobile trips due to the Streetcar Alternative would be minimal on an intersection by intersection or street by street basis, and the conservative assumption and no reductions in volumes at the analysis locations would be appropriate.

3.3.1.3.1 Streetcar Alternative Analysis

Similar to the Enhanced Bus Alternative, the Streetcar Alternative uses the No Build Alternative as the basis for intersection traffic volumes. Thus, the intersection analysis for the Streetcar Alternative also considers capacity adjustments due to the physical and operational characteristics of the streetcar when compared to passenger vehicles, as well as limited transit signal priority treatments along the alignment. The capacity adjustments can be found in Table 3.8. The Streetcar Alternative would operate in mixed-flow conditions with exception to the exclusive lanes north of Alro Way as it enters the O&M facility and the Resorts Station.

Table 3.10 presents the future Streetcar Alternative morning and evening peak hour intersection analysis for the 13 affected Study Area intersections, taking capacity adjustments and 2035 traffic volumes into account. The detailed ICU worksheets are presented in Appendix B. As Table 3.10 shows, 5 of the 13 Study Area intersections are forecast to operate at an unacceptable LOS E or F under the Streetcar Alternative, which is one more compared to the No Build. With the Streetcar Alternative, the intersection of Sportstown/Katella Avenue is projected to degrade from acceptable LOS D to an unacceptable LOS F in the p.m. peak hour, as a result of the need to create a transit-only phase to allow the streetcar to safely transverse through the intersection.

Compared to the No Build Alternative, the Streetcar Alternative shows minor increases to ICU values for all intersections along the alignment. Cross street congestion at the Streetcar Alternative intersections would be less than that in the Enhanced Bus Alternative, since the limited transit priority treatments would not have as much of an effect on the streetcar analysis locations. Figure 3.5 illustrates the proposed Streetcar Alternative alignment and the corresponding LOS at intersections.

Table 3.10 – Future Streetcar Alternative Intersection LOS (2035)

ID	Intersection	No Build Alternative				Streetcar Alternative			
		A.M. Peak Hour		P.M. Peak Hour		A.M. Peak Hour		P.M. Peak Hour	
		ICU	LOS	ICU	LOS	ICU	LOS	ICU	LOS
1	Harbor Boulevard/Transit Center	0.30	A	0.36	A	0.29	A	0.35	A
2	Harbor Boulevard/Disney Way	0.73	C	0.89	D	0.73	C	0.90	D
3	Harbor Boulevard/Katella Avenue	0.83	D	**0.97**	**E**	0.84	D	0.96	**E**
4	Harbor Boulevard/Convention Way	0.60	B	0.79	C	0.60	B	0.80	C
5	Clementine Street/Disney Way	0.58	A	0.58	A	0.58	A	0.60	A
6	Clementine Street/Katella Avenue	0.77	C	**0.92**	**E**	0.76	C	0.95	**E**
9	Anaheim Boulevard/Katella Avenue	**0.92**	**E**	**0.94**	**E**	0.93	**E**	0.95	**E**
11	Manchester Avenue/Katella Avenue	0.75	C	0.73	C	0.75	C	0.73	C
12	Anaheim Way/Katella Avenue	0.83	D	0.79	C	0.84	D	0.80	C
13	Lewis Street Katella Avenue	0.71	C	0.84	D	0.72	C	0.85	D
16	Market Street/Katella Avenue	0.76	C	0.89	D	0.76	C	0.89	D
18	State College Boulevard/Katella Avenue	0.86	D	**0.91**	**E**	0.86	D	0.91	**E**
22	Sportstown/Katella Avenue	0.75	C	0.88	D	0.82	D	0.94	**E**

Source: AECOM

Notes: ICU –Intersection Capacity Utilization; D – Divided Roadway; U – Undivided Roadway; NB – Northbound; SB – Southbound; and HOV – High Occupancy Vehicle

[1] Existing arterial average daily traffic (ADT) calculated by applying a two percent per year growth rate to the 2009 Platinum Triangle Master Land Use Plan Traffic Study existing volumes (PB, 2009)

[2] Volume-to-capacity ratio

Bolded and Shaded – Intersection operates at an unacceptable LOS E or worse, per City guidelines

3.3.1.4 Elevated Fixed-Guideway Alternative

The Elevated Fixed-Guideway Alternative provides low capital cost improvements to the Study Area's transit and roadway systems that meet the identified purpose and need; and provision of enhanced bus service that has a similar level of service as that provided by a rail system. This alternative includes branded bus service, some dedicated bus lane operations, and limited signal preemption or signal priority. The benefits associated with this alternative, referenced from the Draft Forecasting Results Report, include:

- Ridership of approximately 10,768 passengers per day;
- Reduction of approximately 1,002 daily automobile trips within the corridor and 1,025 trips regionally; and
- Reduction in automobile vehicle miles traveled (VMT) of 1,975 miles within the corridor and 31,517 miles regionally.

Figure 3.4 – Future Enhanced Bus Alternative Alignment and Intersection/Roadway LOS (2035)

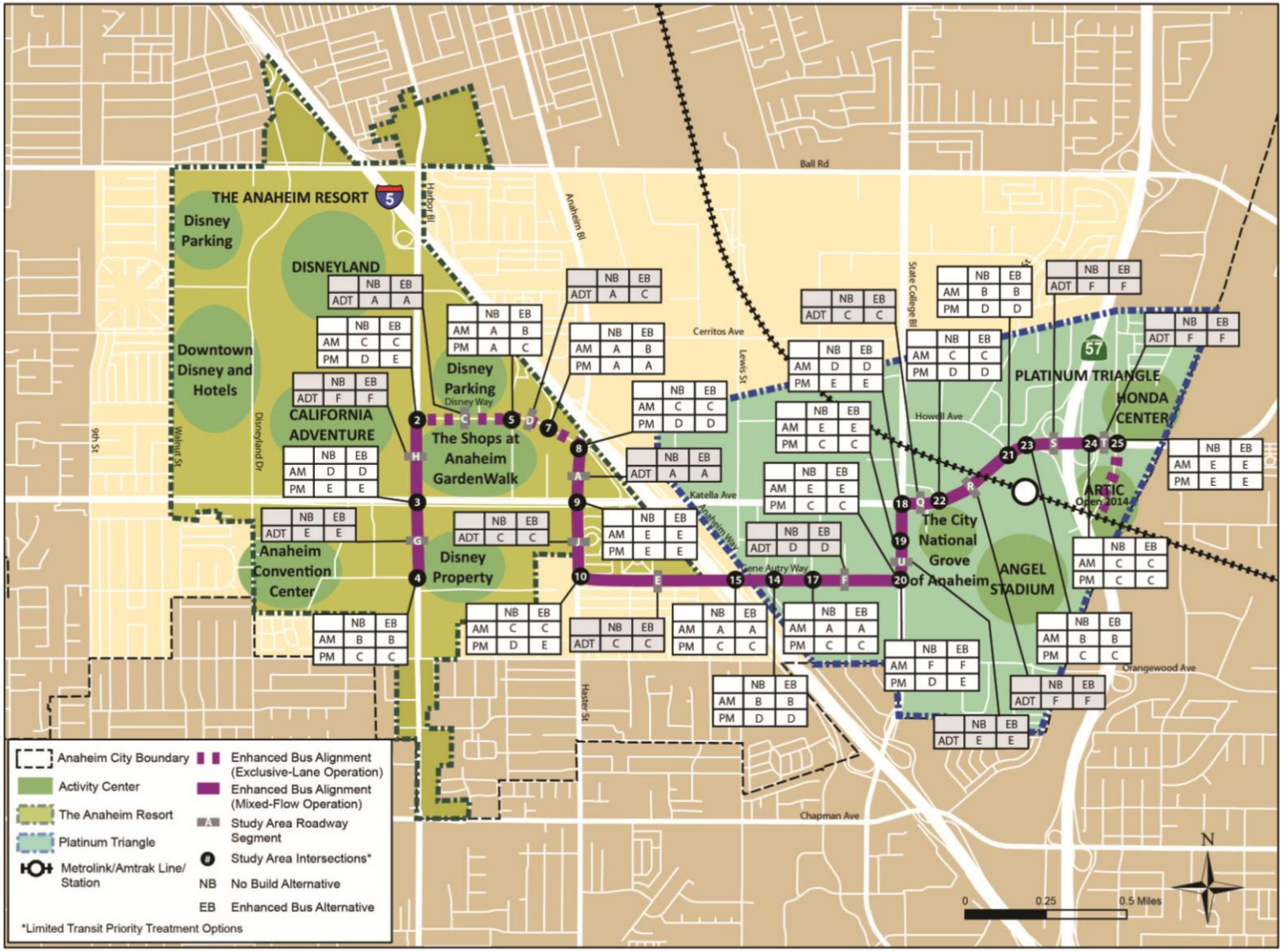
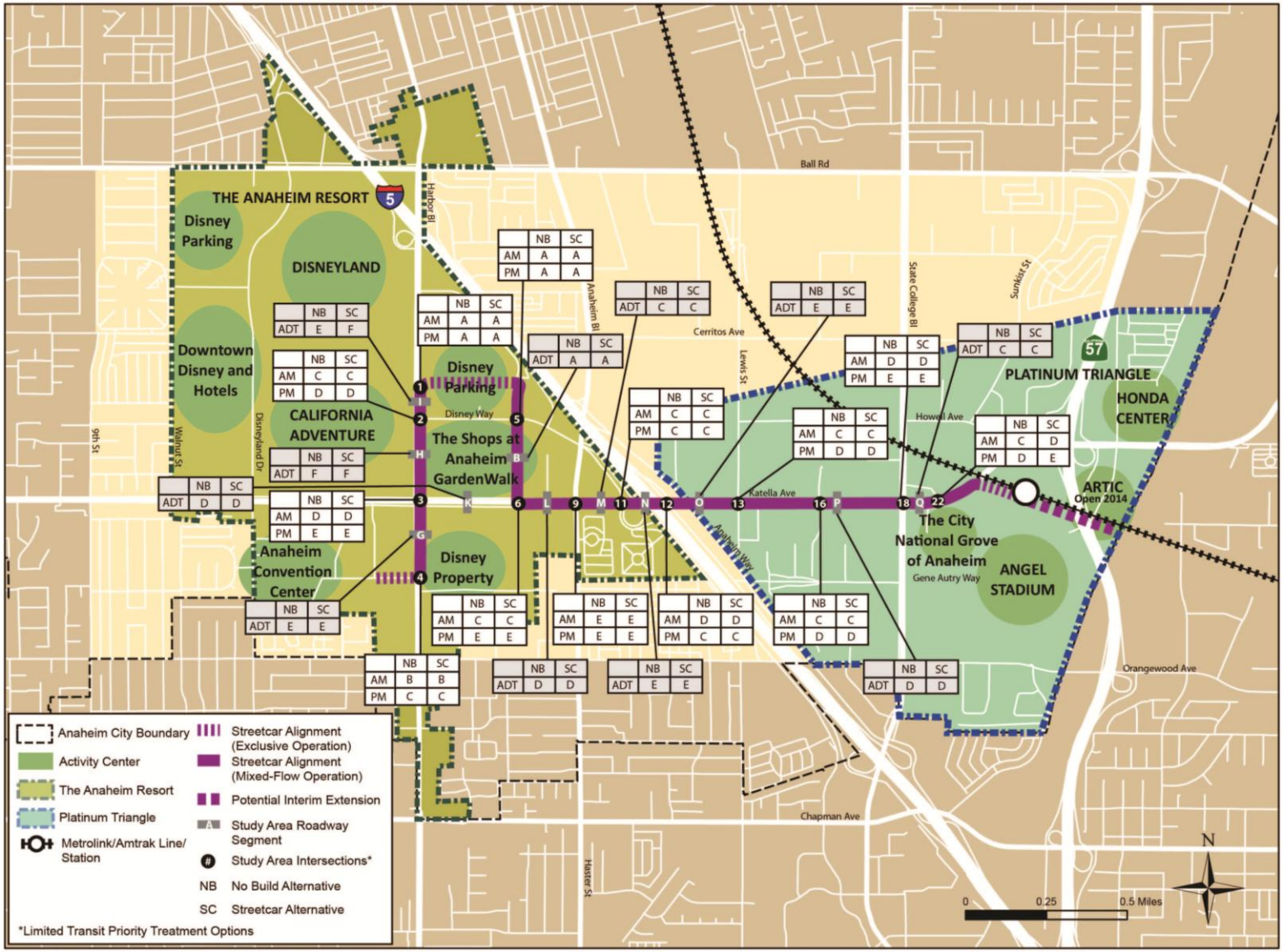


Figure 3.5 – Future Streetcar Alternative Alignment and Intersection/Roadway LOS (2035)



As discussed previously, although this alternative has the potential to reduce automobile trips by 1,025 daily trips within the corridor, no one intersection or roadway segment would be reduced by this amount. The reduction in trips would occur throughout the Study Area based on several origin/destination pairs. Therefore, the potential decrease in automobile trips due to the Elevated Fixed-Guideway Alternative would be minimal on an intersection by intersection or street by street basis, and the conservative assumption of no reduction in volumes at the analysis locations would be appropriate.

3.3.1.3.1 Elevated Fixed-Guideway Alternative Analysis

The operation of the Elevated Fixed-Guideway Alternative would require the installation of columns, which would result in the narrowing of travel lanes to fit the columns within medians or sidewalk areas. However, this would not result in any geometric or traffic volume impacts at any of the Study Area intersections, and guideway support columns would require no lane reductions. Therefore, the resulting intersection LOS for this alternative would be the same as the No Build Alternative.

3.3.2 Roadway Segments

3.3.2.1 No Build Alternative

The roadway segment analysis considers the effect that growth in the Study Area would have on the future circulation system. Future City of Anaheim General Plan Circulation Element lane geometrics were assumed in the No Build Alternative roadway segment analysis. Future 2035 No Build Alternative ADT was obtained by applying the same growth methodology as previously discussed for the intersection operations. As previously mentioned, the capacity of each roadway was obtained from the City of Anaheim General Plan Circulation Element. Table 3.11 presents the future No Build Alternative ADT roadway segment analysis of all 21 Study Area roadway segments. As shown, 12 of the 21 Study Area roadway segments are forecast to operate at an unacceptable LOS D or worse.

3.3.2.2 Enhanced Bus Alternative

The Enhanced Bus Alternative has the potential to affect a total of 13 Study Area roadway segments. The remaining eight Study Area roadway segments are not anticipated to be affected by implementation of the Enhanced Bus Alternative, as those eight segments are not along the proposed alignment.

Table 3.12 presents the 2035 Enhanced Bus Alternative ADT roadway segment analysis for the 13 affected Study Area roadway segments. Seven of the 13 Enhanced Bus Alternative Study Area roadway segments are forecast to operate at an unacceptable LOS D or worse, no more than with the No Build Alternative.

3.3.2.3 Streetcar Alternative

The Streetcar Alternative uses the same ADT volumes as the Enhanced Bus Alternative. However, since the proposed streetcar alignment does not include any exclusive transit lanes (with the exception of the transit-only lanes located north of Alro Way), the only reduction in capacity is based on the operation of six vehicles per hour per direction operating 18 hours per day.

The Streetcar Alternative has the potential to affect up to 11 Study Area roadway segments, based on its alignment. The remaining ten Study Area roadway segments do not fall within the proposed Streetcar Alternative alignment.

Table 3.13 presents the 2035 Streetcar Alternative ADT roadway segment analysis for the 11 affected Study Area roadway segments. As shown in this table, 8 of the 11 Study Area roadway segments are forecast to continue to operate at an unacceptable LOS D or worse, no more than with the No Build Alternative.

3.3.2.4 Elevated Fixed-Guideway Alternative

The operation of the Elevated Fixed-Guideway Alternative would require the installation of columns, which would result in the narrowing of travel lanes to fit the columns within medians or sidewalk areas. However, this would not result in any geometric or traffic volume impacts at any of the Study Area roadway segments, and guideway support columns would require no lane reductions. Therefore, the resulting roadway LOS for this alternative would be the same as the No Build Alternative.

Table 3.11 – Future No Build Alternative Roadway Segment LOS (2035)

ID	Arterial	From	To	Number of Lanes	No Build Alternative			
					ADT[1]	Capacity	ICU[2]	LOS
A	Anaheim Boulevard	Katella Avenue	Disney Way	6D	31,859	56,300	0.57	A
B	Clementine Street	Katella Avenue	Manchester Avenue	4U	8,682	25,000	0.35	A
C	Disney Way	Harbor Boulevard	Clementine Street	6D	17,467	56,300	0.31	A
D	Disney Way	Clementine Street	Anaheim Boulevard	6D	27,328	56,300	0.49	A
E	Gene Autry Way	Haster Street	I-5 Freeway	6D	39,751	56,300	0.71	C
F	Gene Autry Way	I-5 Freeway	State College Boulevard	6D	46,804	56,300	**0.83**	**D**
G	Harbor Boulevard	Convention Way	Katella Avenue	6D	51,611	56,300	**0.92**	**E**
H	Harbor Boulevard	Katella Avenue	Disney Way	6D	58,151	56,300	**1.03**	**F**
I	Harbor Boulevard	Disney Way	Shuttle Entrance	6D	55,865	56,300	**0.99**	**E**
J	Haster Street	Katella Avenue	Gene Autry Way	6D	40,828	56,300	0.73	C
K	Katella Avenue	Harbor Boulevard	Clementine Street	8D	60,550	75,000	**0.81**	**D**
L	Katella Avenue	Clementine Street	Anaheim Boulevard	8D	61,144	75,000	**0.82**	**D**
M	Katella Avenue	Anaheim Boulevard	Manchester Avenue	8D	58,961	75,000	0.79	C
N	Katella Avenue	Manchester Avenue	Anaheim Way	8D	72,871	75,000	**0.97**	**E**
O	Katella Avenue	Anaheim Way	Lewis Street	8D	72,871	75,000	**0.87**	**D**
P	Katella Avenue	Lewis Street	State College Boulevard	8D	65,593	75,000	**0.87**	**D**
Q	Katella Avenue	State College Boulevard	Sportstown	8D	53,221	75,000	0.71	C
R	Katella Avenue	Sportstown	Howell Avenue	6D	63,871	56,300	**1.13**	**F**
S	Katella Avenue	Howell Avenue	SR-57 Freeway	6D	72,973	56,300	**1.30**	**F**
T	Katella Avenue	SR-57 Freeway	Douglass Road	6D	64,476	56,300	**1.15**	**F**
U	State College Boulevard	Katella Avenue	Gene Autry Way	6D	35,795	56,300	0.68	C

Source: AECOM

Notes:

[1] Future 2035 No Build arterial average daily traffic (ADT) calculated by applying a 1.8 percent growth rate to the 2009 Platinum Triangle Master Land Use Plan Traffic Study existing volumes (PB, 2009)

[2] ICU – Intersection Capacity Utilization

Table 3.12: Future Enhanced Bus Alternative Roadway Segment LOS (2035)

ID	Arterial	From	To	No. Lanes	No Build Alternative				Enhanced Bus Alternative			
					ADT[1]	Capacity	V/C[2]	LOS	Capacity Reduction[3]	Adjusted Capacity	V/C[2]	LOS
A	Anaheim Blvd.	Katella Avenue	Disney Way	6D	31,859	56,300	0.57	A	(828)	55,472	0.57	A
C	Disney Way	Harbor Blvd.	Clementine Street	6D	17,467	56,300	0.31	A	(18,767)	37,533	0.47	A
D	Disney Way	Clementine Street	Anaheim Blvd.	6D	27,328	56,300	0.49	A	(18,767)	37,533	0.73	C
E	Gene Autry Way	Haster Street	I-5 Freeway	6D	39,751	56,300	0.71	C	(551)	55,472	0.72	C
F	Gene Autry Way	I-5 Freeway	State College Blvd.	6D	46,804	56,300	**0.83**	**D**	(828)	55,472	**0.84**	**D**
G	Harbor Blvd.	Convention Way	Katella Avenue	6D	51,611	56,300	**0.92**	**E**	(828)	55,472	**0.93**	**E**
H	Harbor Blvd.	Katella Avenue	Disney Way	5D	58,151	46,900	**1.24**	**F**	(690)	46,210	**1.26**	**F**
J	Haster Street	Katella Avenue	Gene Autry Way	6D	40,828	56,300	0.73	C	(828)	55,472	0.74	C
Q	Katella Avenue	State College Blvd.	Sportstown	8D	53,221	75,000	0.71	C	(1103)	73,897	0.72	C
R	Katella Avenue	Sportstown	Howell Avenue	6D	63,871	56,300	**1.13**	**F**	(1103)	55,472	**1.15**	**F**
S	Katella Avenue	Howell Avenue	SR-57 Freeway	6D	72,973	56,300	**1.30**	**F**	(828)	55,472	**1.32**	**F**
T	Katella Avenue	SR-57 Freeway	Douglass Road	6D	64,476	56,300	**1.15**	**F**	(828)	55,472	**1.16**	**F**
U	State College Blvd.	Katella Avenue	Gene Autry Way	6U	35,795	37,533	**0.95**	**E**	(552)	36,981	**0.97**	**E**

Source: AECOM, 2012

Notes:

D – divided; U - undivided

[1] 2035 arterial average daily traffic (ADT) calculated by applying a 1.8 percent growth rate to the 2030 Platinum Triangle Master Land Use Plan Traffic Study volumes (PB, 2009).

[2] Volume-to-capacity ratio.

[3] Reduction in capacity on Disney Way (exclusive bus lanes) based on the capacity of two lanes (e.g., one lane in each direction) and is calculated by dividing the capacity of the roadway by the number of lanes and multiplying by two. All other capacity reductions are based on six buses per hour per direction operating 18 hours per day. Equivalent to a 1.5 percent reduction.

Bolded and shaded – Arterial forecast to operate at an unacceptable LOS D or worse, per City guidelines.

Table 3.13: Future Streetcar Alternative Roadway Segment LOS (2035)

ID	Arterial	From	To	No. Lanes	No Build Alternative				Streetcar Alternative			
					ADT[1]	Capacity	V/C[2]	LOS	Capacity Reduction[3]	Adjusted Capacity	V/C[2]	LOS
B	Clementine Street	Katella Avenue	Manchester Avenue	4U	8,682	25,000	0.35	A	(368)	24,632	0.35	A
G	Harbor Blvd.	Convention Way	Katella Avenue	6D	51,611	56,300	**0.92**	**E**	(828)	55,472	**0.93**	**E**
H	Harbor Blvd.	Katella Avenue	Disney Way	5D	58,151	46,900	**1.24**	**F**	(690)	46,210	**1.26**	**F**
I	Harbor Blvd.	Disney Way	Shuttle Entrance	6D	55,865	56,300	**0.99**	**E**	(828)	55,472	**1.01**	**F**
K	Katella Avenue	Harbor Blvd.	Clementine Street	8D	60,550	75,000	**0.81**	**D**	(1103)	73,897	**0.82**	**D**
L	Katella Avenue	Clementine Street	Anaheim Blvd.	8D	61,144	75,000	**0.82**	**D**	(1103)	73,897	**0.83**	**D**
M	Katella Avenue	Anaheim Blvd.	Manchester Avenue	8D	58,961	75,000	0.79	C	(1103)	73,897	0.80	C
N	Katella Avenue	Manchester Avenue	Anaheim Way	8D	72,871	75,000	**0.97**	**E**	(828)	73,897	**0.99**	**E**
O	Katella Avenue	Anaheim Way	Lewis Street	8D	72,871	75,000	**0.97**	**E**	(1103)	73,897	**0.99**	**E**
P	Katella Avenue	Lewis Street	State College Blvd.	8D	65,593	75,000	**0.87**	**D**	(1103)	73,897	**0.89**	**D**
Q	Katella Avenue	State College Blvd.	Sportstown	8D	53,221	75,000	0.71	C	(1103)	73,897	0.72	C

Source: AECOM, 2012

Notes:

D – divided; U - undivided

[1] 2035 arterial average daily traffic (ADT) calculated by applying a 1.8 percent growth rate to the 2030 Platinum Triangle Master Land Use Plan Traffic Study volumes (PB, 2009).

[2] Volume-to-capacity ratio.

[3] All capacity reductions are based on six cars per hour per direction operating 18 hours per day. Equivalent to a 1.5 percent reduction.

Bolded and shaded – Arterial forecast to operate at an unacceptable LOS D or worse, per City guidelines.

3.3.3 Summary of Future Traffic Conditions

Table 3.14 summarizes the effects of operation of each of the proposed alternatives on future (2035) intersection and roadway segment conditions as described in the previous sections. The conditions are identified for each alternative as the alignments and related intersections and roadway segments differ. For example, the Enhanced Bus Alternative has 19 intersections along its alignment, while the Streetcar Alternative has 13 intersections. The first line under each alternative shows the future number of intersections and roadway segments that are forecasted to operate at unacceptable conditions without capacity improvements under No Build or without implementation of the proposed transit project. The analysis shows that the Enhanced Bus Alternative would negatively affect the operation of two Study Area intersections beyond that of the base conditions identified for 2035, whereas the Streetcar Alternative would negatively affect the operation of one Study Area intersection.

Table 3.14 – Future Intersections and Roadway Segments Operating at LOS E and F (2035)

Alternatives	Intersections (Number)	Roadway Segments (Number)
Enhanced Bus Alternative Alignment Conditions:		
• With no Enhanced Bus project	6 of 19	7 of 13
• With operation of Enhanced Bus service	8 of 19	7 of 13
Streetcar Alignment Conditions:		
• With no Streetcar project	4 of 13	8 of 11
• With operation of Streetcar service	5 of 13	8 of 11
Elevated Fixed-Guideway Alignment Conditions:		
• With no Elevated Fixed-Guideway project	5 of 12	4 of 8
• With operation of Elevated Fixed-Guideway service	5 of 12	4 of 8

Source: AECOM

As indicated in Tables 3.7 and 3.11, there would be several study intersections and roadway segments that would operate with unacceptable conditions (LOS E or F for intersections, LOS D, E or F for roadway segments) under the No Build scenario. These conditions would somewhat worsen with the Enhanced Bus Alternative and Streetcar Alternative, as they would result in reductions in roadway capacity which would lead to increased V/C ratios. Furthermore, both the Enhanced Bus Alternative and Streetcar Alternative would also result in additional intersections worsening to unacceptable conditions (two locations and one location, respectively).

At each location that would operate with unacceptable conditions, the Build alternatives would have the potential for significant intersection or roadway impacts, which will be identified through the future environmental review process and applying the City's significance criteria and impact determinations. It is anticipated, however, that the since the magnitude of V/C ratio increases are forecast be relatively

minor (typically 0.01 to 0.06), it will be possible to develop feasible mitigation measures so that the effect of the alternatives would be minimized.

3.4. Transit System

The City of Anaheim is currently served by several modes of transit including: commuter rail (Metrolink) and intercity rail (Amtrak); extensive fixed-route bus transit provided by OCTA; Stationlink routes that provide bus connections to the Anaheim Amtrak/Metrolink Station and Anaheim Canyon rail stations; and Anaheim Resort Transportation (ART) which provides circulator shuttle service primarily within The Anaheim Resort, though there is limited service to the cities of Garden Grove, Orange, Santa Ana and Buena Park.

Metrolink Service

Commuter rail service is provided by the Southern California Regional Rail Authority, more commonly known as Metrolink, through a five-county area that includes Orange County. The City of Anaheim has two Metrolink stations: the Anaheim Canyon Station served by the Inland Empire-Orange County Line; and the Anaheim Station/planned ARTIC, located in the Study Area, served by the Orange County Line with 15 daily inbound trains to Los Angeles and 14 outbound trains. With ten Orange County stations located between the cities of Buena Park and San Clemente, the Orange County Line had a total average weekday ridership of approximately 8,200, with 91 percent of the trips made for work purposes in 2011. While this line's average trip length is 38.8 miles, there is a significant level (24 percent) of intracounty travel, with trips both originating and ending in Orange County, when compared to other Metrolink lines.

Over the past 14 years, Metrolink has increased its roundtrip routes, added new stations, and has expanded to seven service lines. In 2005, OCTA's Board of Directors approved the Metrolink Service Expansion Program (MSEP) to provide more frequent train service between Fullerton and Laguna Niguel/Mission Viejo. The program is funded by Measure M, Orange County's half-cent transportation sales tax, and has resulted in increased weekday service implemented in July 2011. The OCTA *2010 Long Range Transportation Plan* shows a future increase to 38 trains per day by 2035.

Amtrak Service

Amtrak Pacific Surfliner service operates in California along a rail corridor between the cities of San Luis Obispo and San Diego, and has a high level of ridership that is second only to the Northeast Corridor running between Boston and Washington, D.C. Travel provided by this intercity rail system primarily serves recreational trips (70 percent) compared to work trips (30 percent) reflecting the high number of visitors to the many tourist destinations along this segment of the corridor. Orange County is served by six Amtrak stations: Fullerton, Anaheim, Santa Ana, Irvine, San Juan Capistrano, and San Clemente. The first five stations are also served by Metrolink, with rail-to-rail ridership privileges allowing Metrolink riders to travel via Amtrak as well. During FY2010, there were 331,666 annual Amtrak boardings/alightings at the Anaheim Station/planned ARTIC as compared to 152,733 at the Santa Ana Station. Today, 11 inbound and 11 outbound weekday trains (22 total daily weekday trains) operate

through this portion of the Pacific Surfliner Corridor. The expansion of Pacific Surfliner service in this corridor to 14 daily trains in each direction by 2020 and 18 daily trains in each direction by 2025 is included in the latest California State Rail Plan.

Bus and Circulator Services

OCTA local routes provide service on most major north/south and east/west arterials in the Study Area (refer to Figure 3.6). There are currently six local OCTA bus routes (Routes 43, 46, 47, 50, 57 and 83) that provide service within the Study Area. Two inter-county express bus routes also traverse the Study Area: the Pomona – Santa Ana Express (Route 757) and the Chino – Irvine Spectrum Express (Route 758), although only the Pomona-Santa Ana Express stops in Anaheim. Metro's 460 Line also provides intercounty service from Downtown Los Angeles to The Anaheim Resort. OCTA also operates one Stationlink (Route 430) route that provides peak-period service between nearby activity centers and the Anaheim Stadium Station. Figure 3.6 also presents the Stationlink, express bus and ART network throughout the Study Area.

3.4.1 Existing Transit Service

Table 3.15 summarizes the boarding information for bus routes operating within the Study Area as of 2009. Generally, the existing transit services operate between 19 to 24 hours per day with a 15 to 30 minute service frequency.

OCTA Service

A comparison of the average daily ridership information for 2009 from OCTA, along with Vehicle Service Hour (VSH) information, indicates that the most popular bus routes travel in a north-south direction, serving as connections between the cities of North Orange County and the cities in Central and Western Orange County. The most heavily utilized routes – 43, 47, and 57 – operate along Harbor, Anaheim, and State College Boulevards, respectively, which are in the central portion of the Study Area. OCTA Route 50 and Stationlink 430 travel in an east-west direction within the Study Area, serving as connections between the Anaheim Stadium Station and The Anaheim Resort.

OCTA Stationlink 430 operates for six hours per day during peak commutes (3.5 hours in the a.m. and 2.5 hours in the p.m.), at 30 minute headways. The first bus leaves Anaheim Station at 6:26 a.m. and the last bus reaches at 6:18 p.m. Current travel time between Anaheim Station and Disneyland is approximately 22 minutes, but the connections are not door-to-door. At the west end of Route 430, the nearest bus stop to access the Anaheim Convention Center is located at the intersection of Harbor Boulevard/Katella Avenue, approximately one-half mile (10-minute walk) from the bus-stop to the Convention Center. To access Disneyland, visitors can use either the stop at the intersection of Disneyland Drive/Katella Avenue or at Walnut/Calle De Las Estrellas. The distance from the bus stops to the Disneyland tram stop is approximately 0.85 miles and 0.65 miles, respectively (17-minute and 13-minute walk, respectively).

Route 50 operates for 22 hours per day, at 20 minute headways during peak commute periods. During the off-peak period the headways range between 30 minutes to one hour. The transfer to Route 50 from the Anaheim Station is not seamless as local buses do not enter the station but rather at a bus stop located at the intersection of Howell Street/Katella Avenue and requires a 5-minute walk (approximately 1,500 feet) through an office/retail development and this walk, coupled with a potentially long wait for the 20-minute headway on Route 50 make the current transfer undesirable. The travel time by transit to cover the approximate 3-mile distance between the Anaheim Station and Disneyland takes approximately 22 minutes, not including walk and wait times, under existing peak period conditions. Congested roadway conditions cause the headways and travel time to be unreliable. The closest stop for this route to serve Disneyland is located at the intersection of Harbor Boulevard/Katella Avenue and Walnut Street/Katella Avenue. Both of these stops require a minimum walk-time of approximately 17 minutes to the Disneyland tram station to access the park. OCTA local route fares are $1.50 per boarding or $4.00 for a one-day pass.

Based on a 2010 OCTA on-board survey, of the riders in the Study Area, 39 percent have no access to an automobile and 87 percent of the respondents noted that an automobile was not available for the surveyed trip. Approximately 70 percent of the local bus users pay for their fare through passes rather than a cash fare and the total household income for 67 percent of local bus users is under $30,000. Only two percent of local bus trips are made for recreation or entertainment purposes which denote a distinctly different travel market than visitors to The Anaheim Resort. The current survey noted only two out of 835 trips used Metrolink or Amtrak service for a portion of their trip, supporting the notion that local service does not provide a seamless connection to the regional rail system. Also, approximately 20 percent of the trips required at least one transfer to another bus.

OCTA's “Senior Mobility Program” (SMP) is designed to fill the gap between local fixed route buses and ADA paratransit service (ACCESS) by providing local transportation services to seniors in participating cities in Orange County. The program has created transportation alternatives for seniors in response to one of OCTA's Ten Strategic Initiatives - expand local bus service including specialized bus services for seniors. Since 1977, the City of Anaheim received funding through an agreement with OCTA to contract a SMP minibus service to transport Anaheim senior citizens to and from Project TLC senior lunch program sites. In 2002, the City expanded the program to include a “Senior Wheels” transportation service providing Anaheim senior citizens with rides to local retail stores, banks, libraries, beauty salons, and community centers.

Metro Service

Metro also offers service to Orange County through its limited-stop 460 bus line. Metro Line 460 provides direct service from downtown Los Angeles to The Anaheim Resort and Disneyland. The route operates 22 hours during weekdays and 21 during weekends at 30 minute headways during the week and 30-45 minutes on weekends, with approximately 4,100 daily weekday riders. Line 460 ends at Disneyland’s shuttle entrance on the southeast end of the theme park, providing a direct service to The Anaheim Resort both for visitors and employees.

Figure 3.6 – Existing Transit Service in the Study Area

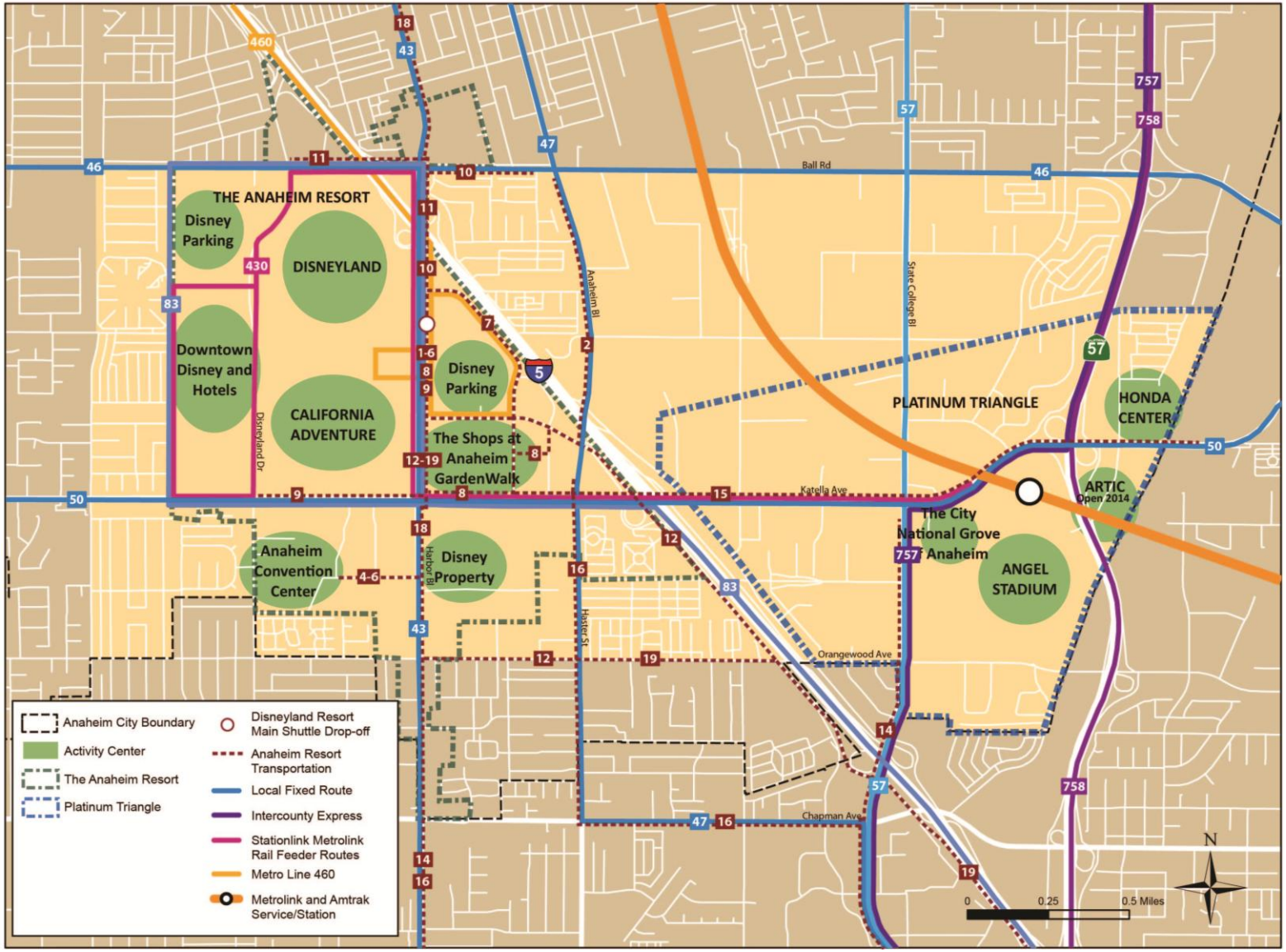


Table 3.15 – Boarding Information for Bus Service in the Study Area

Route Type	Route #	Route Description	Weekday Average			Saturday Average			Sunday Average		
			Boardings	Revenue Vehicle Hours	Boardings per Revenue Vehicle Hour	Boardings	Revenue Vehicle Hours	Boardings per Revenue Vehicle Hour	Boardings	Revenue Vehicle Hours	Boardings per Revenue Vehicle Hour
Local	43	La Habra - Costa Mesa	17,984	312.4	57.6	13,235	245.4	53.9	10,061	199.9	50.3
Local	46	Los Alamitos – Orange	4,540	105.9	42.9	1,641	37.8	43.4	1,234	37.8	32.7
Local	47	Fullerton - Newport Beach	11,557	233.0	49.6	7,887	151.7	52	7,483	152.6	49.1
Local	50	Long Beach – Orange	6,257	148.2	42.2	4,482	101.1	44.3	3,458	100.8	34.3
Local	57	Brea - Newport Beach	16,645	349.2	47.7	12,144	250.6	48.5	10,220	232.4	44.0
Local	83	Disneyland – Laguna Hills Mall	3,309	125.5	26.4	2,231	81.0	27.5	1,482	60.4	24.5
Inter-county Express	757	Pomona - Santa Ana Express	55	6.6	8.4	No service	No service	No service	No service	No service	No service
Inter-county Express	758	Chino – Irvine Spectrum Express	38	18.1	16.7	No service	No service	No service	No service	No service	No service
Inter-county (Metro)*	460	Downtown Los Angeles – The Anaheim Resort	4,171	N/A	N/A	3,766	N/A	N/A	2,879	NA/	N/A
Stationlink	430	Anaheim Amtrak Station - The Anaheim Resort Area	87	5.7	15.2	No service	No service	No service	No service	No service	No service
Stationlink	454	Orange Transportation Center - The Block	245	8.3	29.7	No service	No service	No service	No service	No service	No service
Tourist**	ART (All)	The Anaheim Resort™ and Vicinity	7,922	N/A	N/A	7,719	N/A	N/A	7,719	N/A	N/A

Source: OCTA Monthly Ridership Summary, (2009, Rolling 12 Month Average)
*Source: Metro Ridership (Online Ridership Data), 2009
**Source: ART Database, 2010
N/A – data not available for this route.
Notes: Boardings and Service Hours include portions of these routes outside the Study Area.

ART Service

ART provides service throughout the greater Anaheim Resort area, including the cities of Garden Grove and Orange. ART's service includes fifteen routes which provide access and connections to several major event centers in the Study Area, such as Disneyland, Anaheim Convention Center, Angel Stadium, Anaheim Station/planned ARTIC, and the Block at Orange. However, as a feeder service, ART does not directly serve the major destinations as it is designed to support Anaheim Resort hotels/motels. All ART routes currently originate at the Disneyland Resort Main Shuttle Drop-Off Area and the Disneyland Resort has the highest boardings/alightings for the ART system.

Until mid-2012, ART Route 15 was the only route that connected the Disneyland Resort with the Anaheim Station, with a frequency of every hour and a travel time of 30 minutes. This route was recently changed and ART Route 14 was modified to increase the service to Anaheim Station; however, the routes vary in frequency, alignment and travel time.

ART Route 15 now connects the Disneyland Resort with the Anaheim Station with a frequency of every 60 minutes. The travel time between the Anaheim Station and the Disneyland Resort is approximately 10 minutes during non-peak time with higher travel time during peak hours. The travel time between the Disneyland Resort and the Anaheim Station is approximately 20 minutes during non-peak time, with peak time congestion increasing travel time. This route includes one westbound stop at Katella Avenue/State College Boulevard in the Platinum Triangle with a travel time of approximately ten minutes to the Disneyland Resort during non-peak time; however, the eastbound trip does not have a stop at that location. Passengers must go past Katella Avenue/State College Boulevard, back to Anaheim Station and then back to Katella Avenue/State College Boulevard for their stop, which increases the travel time for their trip back from the Disneyland Resort.

Route 14 was also recently revised to provide service to the Anaheim Station with a frequency of every 30 minutes. This route has a travel time of approximately 10 minutes during non-peak time between the Disneyland Resort and Anaheim Station and 20 minutes between Anaheim Station and the Disneyland Resort. There is no stop in the Platinum Triangle other than Anaheim Station for this route.

There is no ART route that directly connects the Anaheim Station with the Anaheim Convention Center.

Metrolink Service

Metrolink's Orange County line provides service between Oceanside and Los Angeles' Union Station. The line has 14 stations located throughout San Diego County, Orange County, and Los Angeles County. The line operates both weekday and weekends with stops throughout the day at the Anaheim Station (from around 4:30 a.m. to 7:00 p.m. to Los Angeles and 7:30 a.m. to 7:00 p.m. to Oceanside). Amtrak Pacific Surfliner service between Los Angeles and San Diego passes through the central and eastern parts of the Study Area on the same corridor as the Metrolink line, and stops at the Anaheim Station. Currently, northbound trains serve the Angel Stadium of Anaheim Station daily between 7 a.m. and 11 p.m. and southbound trains between 8 a.m. and 10:30 p.m.

3.4.2 Future Transit Improvements

As part of the OCTA's 2010 LRTP and Measure M, additional bus route coverage and greater service frequency are proposed throughout Orange County by 2035. Improvement projects involving almost all major freeways within Orange County are planned, which will make future transit services on these freeways safer and more reliable. Transit services on local streets will also benefit from the Regional Traffic Signal Synchronization Program and Regional Capacity Program for local streets network in Orange County.

The OCTA 2010 LRTP identifies the following Study Area transit improvements to be implemented by 2035:

- BRT service on Harbor Boulevard and Bristol/State College Boulevard, operating at 10-minute headways during peak periods and 14-minute headways in off-peak periods. Increase frequency of OCTA Route 50 on Katella Avenue from 20-minute headways to 15-minute headways during peak periods.
- Increase frequency of OCTA Route 43 on Harbor Boulevard from 30-minute headways to 20-minute headways during peak and off-peak periods.
- Increase frequency of OCTA Route 47 between Fairview and Anaheim from 30-minute headways to 24-minute headways during peak and off-peak periods.
- Increase Metrolink service frequency on the Orange County Line between Fullerton and Laguna Niguel; increase number of trains from 19 per day to 38 trains per day by 2035.
- Establish the Elderly and Handicapped Assistance Program, a proposed countywide effort to expand transportation choices for seniors and the disabled. This program will serve to stabilize fares, provide fare discounts for bus services, and offer specialized access services and future rail services. It also will expand local community van service for seniors through the existing Senior Mobility Program.
- Construct the ARTIC Project, which will be completed in 2014. This facility will include a multi-level transportation terminal which will serve regional and interstate rail, buses and other supporting transit services, and approximately 1,000 surface parking spaces.
- Provide enhanced Metrolink connections: there are two proposed bus transit projects under the Anaheim Go Local program, along with the ARC project. The proposed Bus Rapid Transit (BRT) projects would connect passengers arriving at ARTIC to other activity centers in the City of Anaheim:
  - ARTIC to Downtown Anaheim Connector – a BRT line that will operate in a mixed-flow traffic and connect Downtown Anaheim, the Platinum Triangle, and ARTIC, with a possible extension to the Fullerton Transportation Center.
  - ARTIC to Anaheim Canyon Station Connector – a BRT line that would operate in a mixed-flow configuration either along La Palma Avenue and State College Boulevard, or along the SR-57 Freeway, connecting the ARTIC to the Metrolink Anaheim Canyon Station.
- Construct CHSR service from Los Angeles Union Station to ARTIC.

- Construct California-Nevada Super Speed Train from ARTIC to Ontario Airport (beyond the study horizon year).

3.4.2.1 Operating Assumptions and Plans

The following provides a summary of the general operating assumptions and plans for each of the ARC alternatives. More detailed information would be developed during the next study phase.

Vehicle Assumptions

The vehicles for the alternatives were assumed to be as follows:

- **Enhanced Bus Alternative** – 60 foot articulated buses similar to those used by the Metro Orange Line and planned for future BRT service use by OCTA.
- **Streetcar Alternative** – As the vehicle has not been selected and would be the basis of a future procurement process, the vehicle assumed for the AA analysis was a 70-foot long, 100 percent low-floor, steel-wheel-on-steel-rail modern streetcar with level boarding. The AA study considered vehicles such as the Kinkisharyo AmeriTram and the AnsaldoBreda Sirio that have the option for catenary-free operations.
- **Elevated Fixed-Guideway Alternative** – The technology for this alternative has not been selected, and might be rubber-tire, low speed maglev, or monorail. A two-car rubber wheel vehicle (Bombardier Innova) provided the basis for the cost analysis.

Service Span and Frequency

For the AA-level analysis, the same service span and frequency was used for all of the alternatives – 18-hour daily service span with 10 minute peak headways. At this point in the study process, the travel demand model is not specific enough to indicate how the headway would vary over the course of the day. During subsequent project design work, the service span and frequency would be refined.

Run Time Estimates

A first step in developing ridership projections was identifying run times for each of the alternatives as presented in Table 3.16. To determine the relative speeds of the three Build alternatives, end-to-end travel times were estimated and converted into an average trip speed. For this effort, a corridor simulation model (VISSIM) was used. The VISSIM analysis software is a microscopic model capable of simulating multi-modal traffic flows, including cars, trucks, buses, heavy rail, light rail, bicyclists, and pedestrians. Forecast 2035 traffic volumes and intersection geometrics were used to create simulation networks for the Enhanced Bus and Streetcar Alternatives. No network was created for the Elevated Fixed-Guideway Alternative as this grade-separated system would not be impacted by nor has impacts on the traffic system; this alternative's speed was identified based on operating systems and manufacturer's information. The networks were calibrated to 2035 conditions based on the 2035 intersection capacity utilization analysis results. Signal timing, including transit signal priority, was optimized to reduce transit travel times along the corridor.

The travel time results were based on multiple model runs that simulate a range of potential traffic operations scenarios and incorporating the following input:

- **Speed restrictions for operations** – Speeds used reflected existing OCTA bus operational information and manufacturer information based on operation in three configurations: mixed-flow at-grade guided by the traffic signal system, exclusive right-of-way at-grade; and aerial conditions.
- **Horizontal curves** – Utilized alignment curve radii from the Conceptual Engineering plans.
- **Distances between stations** – Calculated from Conceptual Engineering plans.
- **Dwell and layover times** – Reflected dwell time of 20 seconds.
- **Vehicle performance characteristics** – Utilized acceleration and deceleration rates and maximum operating speeds from current fleet vehicles and manufacturer's information for those not currently in operation.

Table 3.16 – Alternative Definition and Resulting Operational Information

Alternative	Number of Stations	Distance (Miles)	Run Time (Minutes:Seconds)	Average Speed (mph)
Enhanced Bus	5	3.5	20:16	14
Streetcar	6	3.2	18:07	13
Elevated Fixed Guideway	5	3.4	9:26	22

As may be expected the grade-separated Elevated Fixed-Guideway Alternative has the fastest average speed and the shortest travel time based on a one-way trip from the Anaheim Station/ARTIC to the Anaheim Convention Center. The Streetcar Alternative has a slower average speed than the Enhanced Bus Alternative primarily due to mixed-flow operations on Katella Avenue and serving one more station. Its run time is faster than the Enhanced Bus Alternative due to a shorter alignment length.

3.4.2.2 Ridership Projections

The modeling approach for the ARC AA study was a custom application that was responsive to changes in service alternatives such as technology, travel times, service frequency, and station locations. The modeling approach was designed to represent the unique transportation characteristics of the Study Area, such as Metrolink activity at the Anaheim Station and the visitor market within The Anaheim Resort. The custom modeling approach was designed to use key elements of the Orange County Transportation Analysis Model (OCTAM version 3.4), including the zonal and transportation network representations, socioeconomic forecasts, trip generation procedures, and mode choice parameters. These data were combined with survey- and count-derived information on Metrolink and Anaheim ART ridership patterns to develop a spreadsheet-based model to estimate travel on the ARC project alternatives.

By combining key elements of OCTAM with corridor-specific data, a model was created with the ability to focus on the specific attributes of the ARC Study Area, while maintaining the regional strengths of OCTAM. This approach to forecasting was developed in conjunction with staff from the FTA. FTA staff has reviewed the model and forecasts, and concurred with the findings. FTA procedures require that key components of demand be separately reported to allow decision-makers to understand the relationship between this project and other major transportation initiatives in California. To fulfill this requirement, model results presented in this report are segmented into the following seven travel markets:

- ***Metrolink access and egress trips*** – Travel between the corridor and ARTIC for riders connecting to and from Metrolink services to Los Angeles and other locations in the Metrolink service area.
- ***Disneyland Resort[1] and Anaheim Convention Center guests using transit to access resort destinations from their hotels*** – Local guest travel currently served by ART between hotels, the Disneyland Resort, the Anaheim Convention Center, and other destinations in the corridor.
- ***High-Speed Rail access and egress trips*** – Travel between the corridor and ARTIC for riders of the proposed California High-Speed Rail (CHSR) system.
- ***Amtrak access and egress trips*** – Travel between the corridor and ARTIC for riders of existing Amtrak intercity rail services.
- ***Intra-corridor travel that may use transit*** – Travel that begins and ends in the corridor that may use ARC as part of a transit trip.
- ***Disneyland Resort remote parking trips*** – Approximately 10 days per year, Disneyland Resort parking is over capacity. On these days, the Disneyland Resort has an agreement with the Anaheim Convention Center and Angel Stadium of Anaheim to use their parking lots and to shuttle park guests by bus from those locations to the Disneyland Resort. It was assumed that the ARC project will provide this shuttle service on these days.
- ***Angel Stadium and Honda Center event trips*** – Trips by Disneyland Resort or Anaheim Convention Center guests who would travel to Angel Stadium or the Honda Center for a sporting event or concert.

The full methodology and details on the alternatives that were modeled is documented in the *Travel Demand Forecasting Results Report (Appendix C)*. This section compares the potential 2035 ridership and mobility benefits of the Enhanced Bus, Streetcar and Elevated Fixed-Guideway Alternatives to the No Build Alternative. This comparison of alternatives is an integral element of the FTA New Starts project development process, and also provides key information to support the analysis of environmental impacts associated with the project.

[1] The Disneyland Resort includes Disneyland and Disney's California Adventure theme parks.

The forecasts that are used to support this analysis are consistent with the SCAG *2012 RTP* and the 2010 Orange County Projections (OCP). Key assumptions included:

- 2035 population and employment are based on forecasts developed by SCAG for the 2012 RTP.
- Travelers perceive a benefit for using the Elevated Fixed-Guideway system that is equivalent to 15 minutes of travel time above and beyond any measurable improvement in travel time. Users of the Streetcar system perceive a benefit of 7.5 minutes and users of the Enhanced Bus Alternative perceive no additional benefit (beyond the estimated time savings) as compared to conventional bus.
- Phase I CAHSR Service is implemented between Anaheim and San Francisco and this service attracts ridership at Anaheim according to the forecasts contained in the California High-Speed Rail Authority's *December 2009 Business Plan*.

Since the timing of CHSR service at Anaheim is not known with certainty, and since this market contributes a large share of total riders to the ARC system, ridership results are presented before and after the introduction of CHSR service to illustrate the range of anticipated ridership on the ARC system.

Corridor Linked Transit Trips

Table 3.17 presents the annual corridor linked transit trips by alternative in 2035 based on the markets described above. Linked transit trips represent travel from a trip origin to a trip destination regardless of how many transit vehicles are boarded. This number includes both bus and fixed-guideway trips, and is useful in understanding how a particular alternative builds the overall transit market. Annual numbers are reported since each of the forecasted markets is likely to vary considerably over the course of a year. The annual ridership statistic best captures each alternative's contribution to ARC Study Area mobility. The equivalent number of daily linked trips was computed by using a typical annualization factor of 300 days per year to provide a basis of comparison to other transit projects in the FTA New Starts pipeline. Transit trip information for each of the alternatives is presented both with and without CAHSR service to ARTIC.

Table 3.17 – Corridor Linked Transit Trips by Alternative (2035)

Alternative	Before CHSR		After CHSR	
	Annual (Millions)	Daily Equivalent	Annual (Millions)	Daily Equivalent
No Build	4.3	14,221	5.8	19,476
Enhanced Bus	4.6	15,254	6.6	22,112
Streetcar	4.8	15,889	6.9	22,900
Elevated Fixed-Guideway	5.1	16,860	7.6	25,455

Source: RSG, Inc.

In 2035, as shown in Table 3.17, 4.3 million annual corridor linked transit trips are expected under the No Build Alternative without the implementation of CHSR. The number of annual corridor trips would

increase by 1.5 million with operation of CHSR service. The Enhanced Bus Alternative would increase this figure slightly to 4.6 million annual trips without CHSR, and by 2.0 million annual linked trips with implementation of CAHSR (800,000 more trips than No Build). The Streetcar Alternative increases the number to 4.8 and 6.9 million annual linked trips without and with CHSR respectively – 1.1 million more annual trips than No Build (scenario with CHSR). The Elevated Fixed-Guideway Alternative would result in 5.1 and 7.6 million annual linked trips in the corridor – 1.8 million more trips than No Build (scenario with CHSR).

When converted to equivalent daily trips, and comparing the results to the No Build Alternative, the various build alternatives result in the following estimates of daily incremental ("new") riders in 2035 with implementation of CHSR:

- Enhanced Bus – 2,600 daily incremental linked trips (compared to No Build);
- Streetcar – 3,400 daily incremental linked trips (compared to No Build), and 800 daily incremental linked trips (compared to Enhanced Bus); and
- Elevated Fixed-Guideway – 6,000 daily incremental linked trips (compared to No Build), and 3,300 daily incremental linked trips (compared to Enhanced Bus).

Project Boardings by Alternative

Table 3.18 presents the annual project boardings for each alternative in 2035. The Enhanced Bus Alternative would attract 1.9 million riders per year, which is roughly equivalent to 6,300 riders per day. Of this ridership, 50 percent (949,000 annual riders) is related to serving CHSR passengers traveling to and from Anaheim Resort. Another 31 percent (590,000 annual riders) are resort area guests who are diverted from existing ART services. The remaining 19 percent are divided among special events, Metrolink and Amtrak access or egress, and internal corridor travel. Before implementation of the CHSR service to Anaheim, ridership in 2035 is expected to be 0.9 million trips per year, or 1.0 million fewer transit trips.

Table 3.18 – Annual and Daily Equivalent Project Boardings by Alternative (2035)

Alternative	Before CHSR		After CHSR	
	Annual Boardings (Millions)	Daily Equivalent Boardings	Annual Boardings (Millions)	Daily Equivalent Boardings
Enhanced Bus	0.9	3,157	1.9	6,321
Streetcar	1.3	4,169	2.3	7,717
Elevated Fixed-Guideway	1.6	5,310	3.2	10,768

Source: RSG, Inc.

By providing modest time advantages over the Enhanced Bus Alternative, and with the assumption that travelers will perceive and additional 7.5 minutes of benefit[2], the Streetcar Alternative is forecasted to attract 2.3 million annual passengers. This is the equivalent to approximately 7,700 riders per day. The distribution of riders among markets is similar to the Enhanced Bus Alternative with the exception that the share of riders coming from resort area guests (ART diversions) would increase to 35 percent of the total ridership market. Before implementation of CHSR service, the Streetcar Alternative would attract approximately 1.3 million passengers per year, or 1.0 million fewer transit trips.

Given the fact that the Elevated Fixed-Guideway system requires half the travel time and has the highest assumed perceived minutes of time savings, this alternative would attract the highest level of ridership. The Elevated Fixed-Guideway Alternative will attract more than 3.2 million annual customers in 2035. This is equivalent to approximately 10,800 passengers per day. Before CHSR service is implemented, ARC ridership is expected to equal 1.6 million customers per year, or half of the 3.2 million annual transit trips with CHSR.

Table 3.19 shares the significant increase in the potential ridership demand for the ARC project alternatives with implementation of CHSR services. The Streetcar Alternative has a lower percentage of increase than the other two alternatives primarily due to the fact that it has a larger base of ART diversion trips than comparable alternatives. Streetcar succeeds at attracting a larger number of ART diversions since the Convention and Clementine stations are better located than similar stations in the other alternatives. A larger base means a smaller percentage growth when CAHSR is added to the scenario.

Table 3.19 – Increase in Daily Equivalent Project Boardings after CHSR (2035)

Alternative	Additional Daily Boardings	Increase (Percent)
Enhanced Bus	3,164	100.2%
Streetcar	3,548	85.1%
Elevated Fixed-Guideway	5,458	102.8%

Source: RSG, Inc.

Table 3.20 presents the daily equivalent boardings per mile for each of the alternatives. The Streetcar Alternative generates approximately one-third more riders per mile than the Enhanced Bus Alternative and the Elevated Fixed-Guideway Alternative would attract just nearly one-third more passengers per mile than the Streetcar Alternative. To demonstrate the strength of the projected boardings per mile for the ARC: in 2012, the Metro Orange Line (a dedicated bus facility in Los Angeles) had 1,965 daily (weekday) boardings per mile, the Portland Streetcar had 1,120 daily boardings per mile, and the Metro Gold Line (operating in Los Angeles, Pasadena, and East Los Angeles) had 2,140 daily boardings per mile.

[2] Specifically, travelers will react to the visibility and reliability of a Streetcar system in the same way that they would react to an additional 7.5 minutes of travel time savings.

These projects were selected as they have similar land use and density patterns as the Study Area, but it should be noted not the major national and international destinations that Anaheim has.

Table 3.20 – Daily Equivalent Boardings Per Mile after CAHSR (2035)

Alternative	Daily Boardings	Alignment Length (Miles)	Boardings Per Mile	Increase Compared to Enhanced Bus (Percent)	Increase Compared to Streetcar (Percent)
Enhanced Bus	6,321	3.5	1,806	--	--
Streetcar	7,717	3.2	2,412	33.6%	--
Elevated Fixed-Guideway	10,768	3.4	3,167	75.4%	31.3%

Source: RSG, Inc.

Transportation System User Benefits by Alternative

Table 3.21 presents the forecasted Transportation Systems User Benefits associated with implementation of each of the proposed alternatives. The Enhanced Bus Alternative is compared to the No Build Alternative to show the impact that this low cost alternative offers as compared to taking no action beyond those plans already expected to occur by 2035. The two fixed-guideway alternatives that would involve major capital expenditures, the Streetcar and Elevated Fixed-Guideway Alternatives, are compared to the Enhanced Bus Alternative to demonstrate the value of these more expensive options as compared to the lower cost action.

Table 3.21 – Daily Equivalent Transportation System User Benefits by Alternative after CHSR (2035)

	Enhanced Bus (Hours)	Streetcar (Hours)	Elevated Fixed-Guideway (Hours)
Compared to No Build	2,054	3,134	4,797
Compared to Enhanced Bus	--	1,080	2,743
Compared to Streetcar	--	--	1,663

Source: RSG, Inc.

Benefits for the Enhanced Bus Alternative are equivalent to approximately 2,100 hours per day (as compared to the No Build Alternative). The Streetcar and Elevated Fixed-Guideway alternatives offer an additional 1,100 and 2,700 hours of savings per day, respectively, as compared to the Enhanced Bus Alternative. The latter value is equivalent to about 14 minutes of benefit per passenger. Since average User Benefits per passenger are often approximately half of the maximum benefits[3], the result is consistent with the alternative definition that offers a maximum of 10 minutes of real time savings and 15 minutes of mode-based perceived benefits.

[3] End-to-end riders will receive the maximum benefit of the project while other riders are traveling in locations where the walking time required to access the guideway means there is very little advantage over competing bus services. If there are no passengers who are worse off as a result of the project, the average User Benefit must lie between these two extremes—often at 50 percent of the maximum value.

3.5 Other Modes

Other transportation modes within the Study Area include access via walking and bicycling. The City has developed plans to expand its bicycle network through its *Bicycle Master Plan* and implementation of a bike-share program, and increase the number of open and recreational spaces as identified in the *Anaheim Outdoors Connectivity Plan* currently being developed.

3.5.1 Existing Pedestrian and Bicycle System

Pedestrian Facilities

The Study Area has varying types of pedestrian facilities and crossings. Pedestrian facilities within the Study Area include sidewalks, walkways, pedestrian bridges, crosswalks, and pedestrian signals, and especially within The Anaheim Resort, represent an important part of the transportation system. All major streets within the Study Area have sidewalks, with the exception of streets that lead to and from the I-5 freeway on- and off-ramps (and other minor locations). All major signalized intersections within the Study Area have full crosswalks and pedestrians signals. Many of the Study Area's major roadways have relatively high travel speeds without substantial buffers, provide few pedestrian amenities, and many intersections require long crossing distances. The exceptions are The Anaheim Resort and some locations in the Platinum Triangle where landscaped parkways are provided.

Based on field observations and evaluations, the majority of Study Area arterials have good overall walkability due to the current sidewalk widths and robust crossing facilities. Pedestrian conditions were observed within the Study Area on a typical weekday during the mid-day period (generally 12:00 to 2:00 p.m.). During this period, pedestrians were observed walking along sidewalks and crossing intersections at signalized locations. At each location, qualitative assessments of the pedestrian environment and crossing conditions were taken. The assessments took into account the following four qualities relevant to the pedestrian environment:

- **Separation from Traffic** – Separation from traffic is defined by the availability of a buffer between pedestrians and vehicular traffic created by on-street parking, trees, and other street furniture. For the majority of the streets in the Study Area, there is no on-street parking and limited street furniture and trees. In The Anaheim Resort, there are pedestrian-oriented features including landscaping and rows of street trees on both sides of the street.
- **Pedestrian Crossing Conditions** – Crossing distances, block lengths, and distances between crossings were estimated, and qualitative crossing conditions were assessed during field reviews. The crossing conditions include pedestrian countdown signals, street names and signage, curb ramps and ramp warnings, crosswalk condition, and pedestrian refuges (including curb extensions and/or medians). At the major intersections in the Study Area, there are crosswalks at all four intersections approaches, and pedestrian signals are provided. At the intersections near the freeway on- and off-ramps, pedestrian access is only accommodated on certain approaches.

- **Pedestrian-Supporting Infrastructure** – The availability and quality of the pedestrian infrastructure inventory was gathered during field observations, which included an evaluation of lighting, benches, landscaping and street trees, sidewalks, and sidewalk obstructions.
- **Travel Speeds of Adjacent Streets** – The travel speeds of the adjacent roadways can influence pedestrian activities, as high-speeds (especially in conjunction with limited separation from the travel lanes) reduce the attractiveness of walking. Auto speeds were estimated from the posted speed limits and confirmed with field observations. Many Study Area arterials have posted speed limits of 35 or 40 miles per hour.

Typically, pedestrians are focused in the vicinity of office buildings or retail establishments, near the OCTA and ART bus stops, or walking to and from the Anaheim Station. However, there are relatively high volumes of pedestrians walking in The Anaheim Resort, primarily from the adjacent hotels and commercial uses to key destinations, such as the Disneyland Resort. In addition, pedestrian volumes significantly increase during events at the Anaheim Convention Center, and before and after events at Angel Stadium and Honda Center. Along other streets in the Study Area, pedestrian volumes were observed to be relatively light throughout normal weekdays. This will change with future implementation of the mixed-use development identified in the *Platinum Triangle Master Land Use Plan*.

In The Anaheim Resort, especially near the Disneyland Resort, Anaheim Convention Center, and hotel area, enhanced pedestrian facilities are provided, including wider sidewalks, separation from traffic flows with landscaping and rows of trees, and additional crossing amenities. These improved facilities help accommodate the substantially higher pedestrian volumes in the area. Similar types of enhancements for improved walkability can be found in the Platinum Triangle area. As part of the *Platinum Triangle Master Land Use Plan*, additional amenities are identified for future implementation, including items such as landscaping, buffers between the sidewalk and street, building setbacks, and landscaped parkways.

Bicycle Facilities

The City of Anaheim currently has three classifications of bikeways:

- **Class I Bikeways** provide for bicycle travel on right-of-way completely separated from the street;
- **Class II Bikeways** provide striped and signed lanes within the existing street right-of-way; and
- **Class III Bikeways** are commonly signed-only bike routes.

In the Study Area, the Santa Ana River Trail is classified as a Class I Bikeway and connects with Orange County's riding and hiking trails following the western bank of the river (eastern boundary of the Study Area) as it moves south to the ocean in Huntington Beach. Currently, there are Class II Bikeways on Orangewood between 9th Street and Janette Street as well as between Harbor Boulevard and Mountain View Avenue, and another on 9th Street between Katella Avenue and Chapman Avenue. There is one bicycle parking facility within the Study Area located at the Anaheim Station, which allows bicyclists to

link to other transportation modes within the Study Area. The City has also launched a bike-share program with bike-lending kiosks proposed at Angel Stadium/Anaheim Station, the Anaheim Convention Center, The City National Grove of Anaheim, Honda Center, The Shops at Anaheim GardenWalk, and The Anaheim Resort, along with other locations outside of the Study Area. Approximately 100 bicycles are being made available to residents throughout the City at various locations. Providing such bicycle-transit links allows greater numbers of people to use bicycles as a transportation option within the City of Anaheim. Additionally, OCTA buses which serve the Study Area are equipped with bicycle racks on every bus that can carry up to two bicycles per bus.

Bicycle conditions were observed within the Study Area on a typical weekday during the mid-day period (generally 12:00 to 2:00 p.m.). During the mid-day period, few bicyclists were observed along the roadways in the Study Area. Due to the general high travel speeds of the roadways and the lack of designated bicycle routes, there are no attractive streets for use by bicyclists. Many Study Area businesses do not provide well-marked and safe bicycle parking facilities.

3.5.2 Future Pedestrian and Bicycle System Improvements

The City of Anaheim is preparing an *Outdoors Connectivity Plan* to identify areas for potential recreational, pedestrian, and bicycle use improvements and promote the connectivity of pedestrian trails and bikeways throughout the City. Many improvements have been identified in and around the Study Area, including new park and pedestrian trail opportunities. Figure 3.7 shows the planned sidewalks for the Platinum Triangle. Proposed bikeways match those within the *Bicycle Master Plan*. Potential bicycle parking facilities have also been identified in The Anaheim Resort.

The *City of Anaheim Bicycle Master Plan*, which encompasses the entire Study Area, also contains goals to promote and increase bicycle transportation, improve the local and regional bikeway network, and increase the benefits of bicycling. As shown in Figure 3.8, the City of Anaheim has undertaken efforts to plan for a more extensive bicycle network throughout the Study Area. Some highlights include introducing Class I Bikeways on the Edison/Union Pacific ROW from Harbor Boulevard to Douglas Road, Lewis Street between Ball Road and Katella Avenue. Class II Bikeways are planned on Anaheim Boulevard between Santa Ana Street and Cerritos Avenue, Cerritos Avenue from Anaheim Boulevard south onto Douglass Road to connect to the Santa Ana River Trail via Katella Avenue. Class II Bikeways are proposed along Orangewood Avenue between Haster Street and Dupont Drive, as well as north along 9th Street from Katella Avenue to Cerritos Avenue. In addition, there are a number of proposed bicycle parking facilities that are located in the Study Area. These parking facilities are generally proposed for the area surrounding Disneyland, along Harbor Boulevard, Katella Avenue, and Disneyland Drive.

3.5.3 Potential Benefits and Challenges for Pedestrians and Bicyclists

Implementation of a new transit system with associated pedestrian and bicycle improvements would l have both benefits and challenges for Study Area pedestrians and bicyclists. Benefits could include potential transit system-related improvements that would encourage and enhance pedestrian and

Figure 3.7 – Planned Sidewalks in The Platinum Triangle

Figure 3.8 – Existing and Proposed Bikeways in the Study Area

bicycle activities through new improvements and increased safety tools and awareness as well as improved longer distance access via transit. Possible benefits resulting from increased pedestrian and bicycle access to any new system may include:

- Reduced automobile traffic generated by a new transit system along with a possible decrease in related parking requirements.
- Increased pedestrian activity supporting land uses and activities and enhancing the sense of community in station areas and along the system's alignment.
- Enhanced community safety and security with more activity and "eyes" on the street.
- Improved health for Study Area residents.

All of the alternatives under consideration would have possible challenges, and benefits, for pedestrians and bicyclists with the introduction of a high-capacity transit system and related increased circulation activity in the station areas due to pedestrian, bicycle, bus or circulator, drop-off, or park-and-ride access activity. Possible challenges to pedestrian and bicyclist safety may include the following that would be addressed during the preparation of the final system and station design documents:

1. Conflicts between vehicular traffic and an increased number of pedestrians and bicyclists, particularly in station areas (Enhanced Bus, Streetcar, and Elevated Fixed-Guideway Alternatives).
2. Conflicts between transit vehicles and bicyclists where they need to share the street right-of-way (Enhanced Bus and Streetcar Alternatives).
3. Prevention of crossings of streets and rail tracks except at designated, protected locations for all bus or streetcar crossings (Enhanced Bus and Streetcar Alternatives).
4. Concerns regarding bicyclists riding parallel to the rail tracks where bicycles' tires may get stuck in the tracks (Streetcar Alternative).
5. Concerns about the safety, security, and convenience of pedestrians waiting in transit station areas, sidewalk width, and adequate amenities such as shelters, benches, and so forth (Enhanced Bus, Streetcar, and Elevated Fixed-Guideway Alternatives).
6. Concerns about pedestrian crossing and waiting safety in areas with columns supporting grade-separated guideway sections (Elevated Fixed-Guideway Alternative).

There are a full range of possible improvements that could be made to reduce these challenges and create opportunities to encourage bicycle and walk access, such as provision of street crossing improvements and widening of sidewalks in station areas, that would be considered as more detailed system and station area plans are developed. Other improvements could include provision of station area bicycle racks or lockers. The City's plans for a shared-bicycle program would support increased bicycle access to the future transit project. All of these improvements, along with landscaping, street furniture, and land uses that encourage pedestrian activity will contribute to creating a multi-modal, pedestrian-oriented environment that supports a future transit system investment and future Study Area development plans.

3.6 Summary of Transportation System Impacts and Benefits

The following provides an overview of the highway system, transit system, pedestrian, and bicyclist challenges, including capacity constraints and safety issues, possibly resulting from implementation of the No Build, Enhanced Bus, Streetcar, and Elevated Fixed-Guideway Alternatives. At this level of analysis, possible challenges have been noted, but are not specified nor are mitigation measures identified. The identified challenges are considered reasonably representative for the purpose of comparing alternatives. During any subsequent preliminary engineering work, the proposed system components and requirements would become more detailed, and challenges to vehicular traffic, pedestrians, and bicyclists would be assessed and mitigated. The whole area is busy with pedestrians today/city successfully improved walking and biking environment in The Anaheim Resort.
ADD about how whole idea is to create multi-modal/encourage people to use different modes/designed

3.6.1 No Build Alternative

Intersections

Under the No Build Alternative, approximately **6 out of the 19** Enhanced Bus Alternative Study Area intersections are forecast to operate at an unacceptable LOS E or worse. Approximately **4 of the 13** Streetcar Alternative Study Area intersections are also forecast to operation at LOS E or worse under the No Build Alternative.

Roadway Segments

Full buildout of the City of Anaheim General Plan lane configurations would have a minimal effect on overall roadway segment operations and LOS. According to the Future 2035 No Build ADT analysis, **7 of the 13** Enhanced Bus Alternative Study Area roadway segments are anticipated to operate at an unacceptable LOS D or worse, where **8 of the 11** Streetcar Alternative Study Area roadway segments would also operate at LOS D or worse.

Pedestrians and Bicyclists

The minor increases in bus services and changes to the roadway network may have minimal benefit on pedestrian and bicycle facilities, and where necessary would be addressed in project-specific environmental documentation.

3.6.2 Enhanced Bus Alternative

Intersections

As compared to the No Build Alternative, the Enhanced Bus Alternative would result in two additional intersections operating at unacceptable (LOS E or F) conditions (Harbor Boulevard/Disney Way and Haster Street/Gene Autry Way). It would also result in decreases in capacity at several intersections that are projected to operate at LOS E or F, thereby potentially increasing congestion at these locations.

Roadway Segments

According to the Future 2035 Enhanced Bus ADT analysis, **7 of the 13** Study Area roadway segments are anticipated to operate at an unacceptable LOS D or worse, which is equivalent to the number of

deficient intersections under the No Build Alternative. The Enhanced Bus Alternative would not result in any additional roadway segments to operate at an unacceptable LOS. However, implementation of the Enhanced Bus Alternative would cause minor decreases in capacity at locations operating at LOS D, E, or F, thereby potentially increasing congestions at these segments.

Pedestrians and Bicyclists

Implementation of the potential solutions to pedestrian and bicycle challenges would assist in minimizing any potential negative effects of increased pedestrian and bicycle activity.

Enhanced Bus Benefits

The benefits associated with this alternative, referenced from the Draft Forecasting Results Report, include:

- Ridership of approximately 6,321 passengers per day;
- Reduction of approximately 630 daily automobile trips within the corridor and 319 trips regionally; and
- Reduction in automobile vehicle miles traveled (VMT) of 1,269 miles within the corridor and 9,802 miles regionally.

3.6.3 Streetcar Alternative

Intersections

As compared to the No Build Alternative, the Streetcar Alternative would result in one additional intersection operating at unacceptable (LOS E or F) conditions (Sportstown/Katella Avenue). It would also result in decreases in capacity at several intersections that are projected to operate at LOS E/F, thereby potentially increasing congestion at these locations.

Roadway Segments

According to the Future 2035 Enhanced Bus ADT analysis, **8 of the 11** Study Area roadway segments are anticipated to operate at an unacceptable LOS D or worse, which is equivalent to the number of deficient intersections under the No Build Alternative. The Streetcar Alternative would not result in any additional roadway segments to operate at an unacceptable LOS. However, implementation of the Streetcar Alternative would cause minor decreases in capacity at locations operating at LOS D, E, or F, thereby potentially increasing congestions at these segments.

Pedestrians and Bicyclists

Implementation of the potential solutions to pedestrian and bicycle challenges would assist in minimizing any potential negative effects of increased pedestrian and bicycle activity.

Streetcar Benefits

The benefits associated with this alternative, referenced from the Draft Forecasting Results Report, include:

- Ridership of approximately 7,717 passengers per day;
- Reduction of approximately 732 daily automobile trips within the corridor and 496 trips regionally; and
- Reduction in automobile vehicle miles traveled (VMT) of 1,528 miles within the corridor and 15,279 miles regionally.

3.6.4 Elevated Fixed-Guideway Alternative

Intersections

The operation of the Elevated Fixed-Guideway Alternative would not result in any geometric or traffic volume changes on any of the Study Area intersections. As such, the resulting intersection LOS for this alternative would be identical to the No Build Alternative.

Roadway Segments

The operation of the Elevated Fixed-Guideway Alternative would not result in any geometric or traffic volume changes on any of the Study Area intersections. As such, the resulting ADT LOS for this alternative would be identical to the No Build Alternative.

Pedestrians and Bicyclists

The minor increases in bus services may have minimal benefit on pedestrian and bicycle facilities, and where necessary would be addressed in project-specific environmental documentation.

Elevated Fixed-Guideway Benefits

The benefits associated with this alternative, referenced from the Draft Forecasting Results Report, include:

- Ridership of approximately 10,768 passengers per day;
- Reduction of approximately 1,002 daily automobile trips within the corridor and 1,025 trips regionally; and
- Reduction in automobile vehicle miles traveled (VMT) of 1,975 miles within the corridor and 31,517 miles regionally.